FINA 160A

User's Manual

600400170

Version 1.0

Thank you very much for purchasing our printer

- In order to use this printer correctly and safely and understand this product's capability, please read this manual carefully.
- The manual includes equipment structure, description, technical parameters, operation manual, safety information and application of software, etc.
- This manual is subject to change without notice.
- Contents here in contained are believed to be correct, however, please contact us if you find any error or something not clear enough.

Version 1.0

June 2007

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Chapter 1 Safety information

Before use your FINA160A Inkjet Digital Printer （Hereafter refer to printer）, please read following safety information. Pay attention to the cautions on the Printer.

1.1 Safety precautions

- **Install over-current and over-voltage facility for printer power.** Failure to follow this guide could result in electric shock, personnel injury and fire.
- **Clean the ink channels with solution matching to the used ink.** Failure to follow this guide could result in filter clog and ink channel blockage.
- **Besides the ground-line for power, another unattached ground-line should be connected outdoor.** Failure to follow this guide could result in abnormal work status of printer.
- **Static prevent facility should be settled on the carpet or in dry climate.** Failure to follow this guide could result in print head or other parts damage on the printer.
- **Waiting for 10 minutes at least after power off to transport, connect and check the printer.** Failure to follow this guide could result in electric shock.
- **Printer should be settled on flat floor and be adjusted horizontally.** Failure to follow this guide could reduce the print resolution.
- **Clean the print head and ink channel with solution after long-time printing.** Failure to follow this guide could result in print head damage and ink channel clog.
- **Never put hands on depend fence while the printer is working.** Failure to follow this guide could result in hand crushing.
- **Never put hands into the heating board while the board is heating.** Failure to follow this guide could result in hand scald.
- **Never put hands on rotating rollers while the printer is working.** Failure to follow this guide could result in hand crushing.
- **Don't open the electric tank in normal condition.** Failure to follow this guide could result in electric shock.

1.2 Important Safety Information

- Do not block the hole on the cover.
- Do not insert any object into the Printer groove. Don't let any kind of liquid splash into Printer.
- Only use the power supply according to the label. You may choose either AC 110V or 220V for different countries and regions.
- Connect all the equipment to a properly grounded socket. Avoid the socket in the same circuit with copy machine or air conditioner.
- Avoid to using the socket controlled by the wall switch or by auto timer.
- Please keep Printer away from the latent source of electromagnetic disturbance. For example, loudspeaker or wireless phone.
- If you use additional cable, please make sure that total amperage of the equipment connecting with cable shall not exceed the amperage of the power supply. Moreover, the amperage of all equipment connecting with wall socket does not exceed the amperage of the wall socket.
- Do not use damaged Electrical Power wire.
- Do not repair Printer by yourself.

- Shut off the power and ask experienced technician for help, if the following situations occur:
  Power cable or plug is damaged.
  Liquid splashes into printer.
  Printer falls down or broken.
  Printer cannot work properly or change in property.

1.3 Caution When Using Printer

- Don’t use your hand to move print head; otherwise the printer will be damaged.
- Always use power switch to turn On/off the printer. Before shutting down the Printer, do not pull out Power Supply wire or Data Wire.
- Before moving the printer, please make sure the print head is fixed at original position.

1.4 Guide When Using Ink Cartridge

- Keep ink away from children. Do not let the children drink or touch.
- If ink spills on the skin, please wash with soap and water. If ink splashes into eye, please wash with water immediately
- Do not shake the ink cartridge in case ink leak is caused.
- Please keep surrounding clean when you replace a new ink container. It helps you improve printing quality.

1.5 Choosing Printer Installation Place

- Put printer at a horizontal and stable place with enough space; otherwise, the Printer may not work properly.
- Don’t leave Printer at a place where temperature and humidity change severely. Avoid direct sunlight, strong light or heat.
- Avoid shaking or vibrating.
- Keep sufficient room around printer for air circulation.
- Place printer nearby the wall socket, so that it is easy to connect or disconnect the power supply.

1.6 Warning, Caution and Attention

Warning

Must obey in order to ensure personal safety.

Caution

Must obey in order to protect the machine.

Attention

Contain some important and useful information about operation.

Chapter 2 Technical Parameters

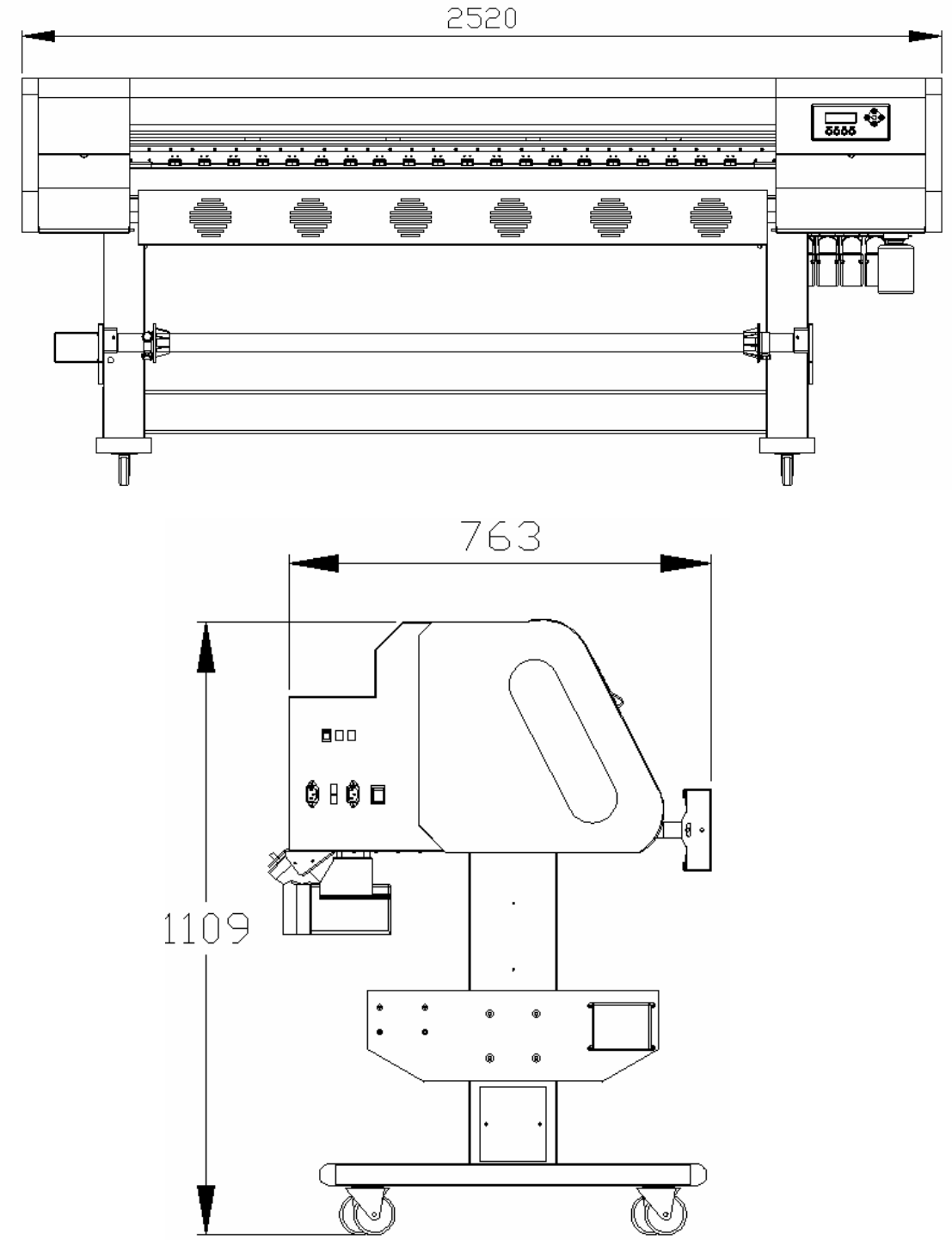


Chart 2-1 Printer Outlook and dimension

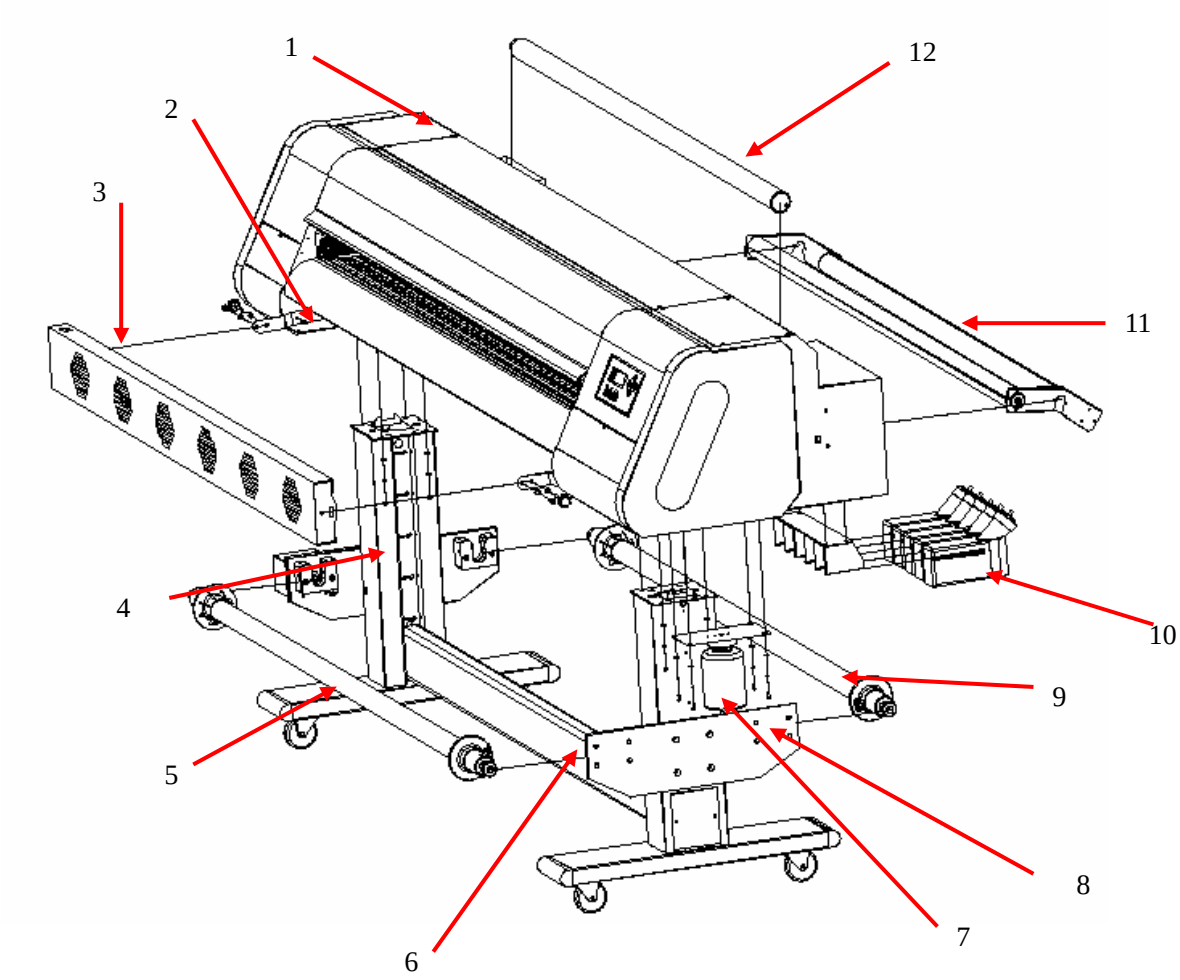
Product Model	FINA 160A	
Print Head	Xaar 126/600 DPI piezo head, 8 heads inside	
Drop size	30pl	
Speed	4 PASS	19.7 M2/Hr
	6 PASS	15.2 M2/Hr
	8 PASS	10.2 M2/Hr
	12 PASS	8.0 M2/Hr
Max Media Width	1620mm	
Max Media Weight	〈〈 40KG	
Media type	PVC， Flex， Vinyl，l window film，polyester， etc	
Max Printing Width	1600mm	
Media Transmission	Auto Media Feeding & Take-up system(Take-up is OPTIONAL)	
Color	4 color	
Display	LCD display with 8 key panel， self-diagnosis available	
Ink Type	Eco-solvent and Solvent-base ink， main ink tank volume	
Main features	Auto Media heating(Pre-heater, middle plate heater, P/H heater Drier fans(OPTIONAL) Auto Print-heads Cleaning and Capping system	
Print head Height	2mm-4mm above media adjustable	
Operation Platforms	Multi-operation platforms (Window2000, XP, etc.)	
Print Interface	USB2.0 interface (Window2000、NT、XP etc)	
Printer Driver	Aprint RIP, Support Onyx, Scanvec, Wasatch RIP	
Power	AC100-120V±10% OR AC200-240V±10% 50HZ/60HZ, 1400VA	
Working Environment	Temperature：20°C ~ 30°C Humidity： 40% ~ 70%	
Printer Size/Weight	Net Weight: 2600mm(L) X 870mm(W) X 1200mm(H) 180KG Gross: 2700mm(L) X 740mm(W) X 750mm(H) 180KG	

The parameters above are subject to change without notice.

Chapter 3 Equipment Assembly and Adjustment

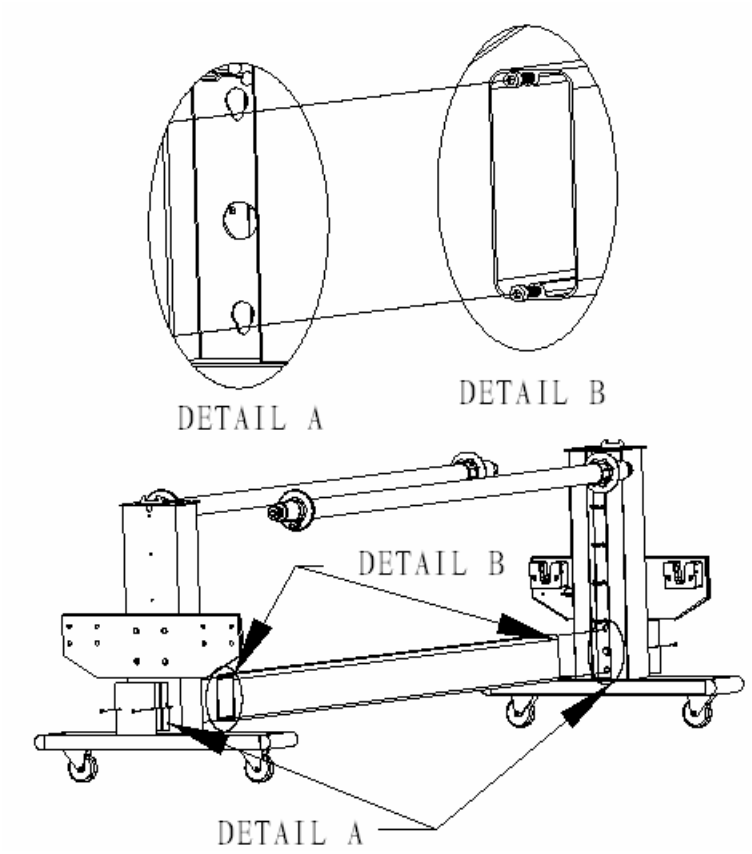
3.1 Assemble Printer

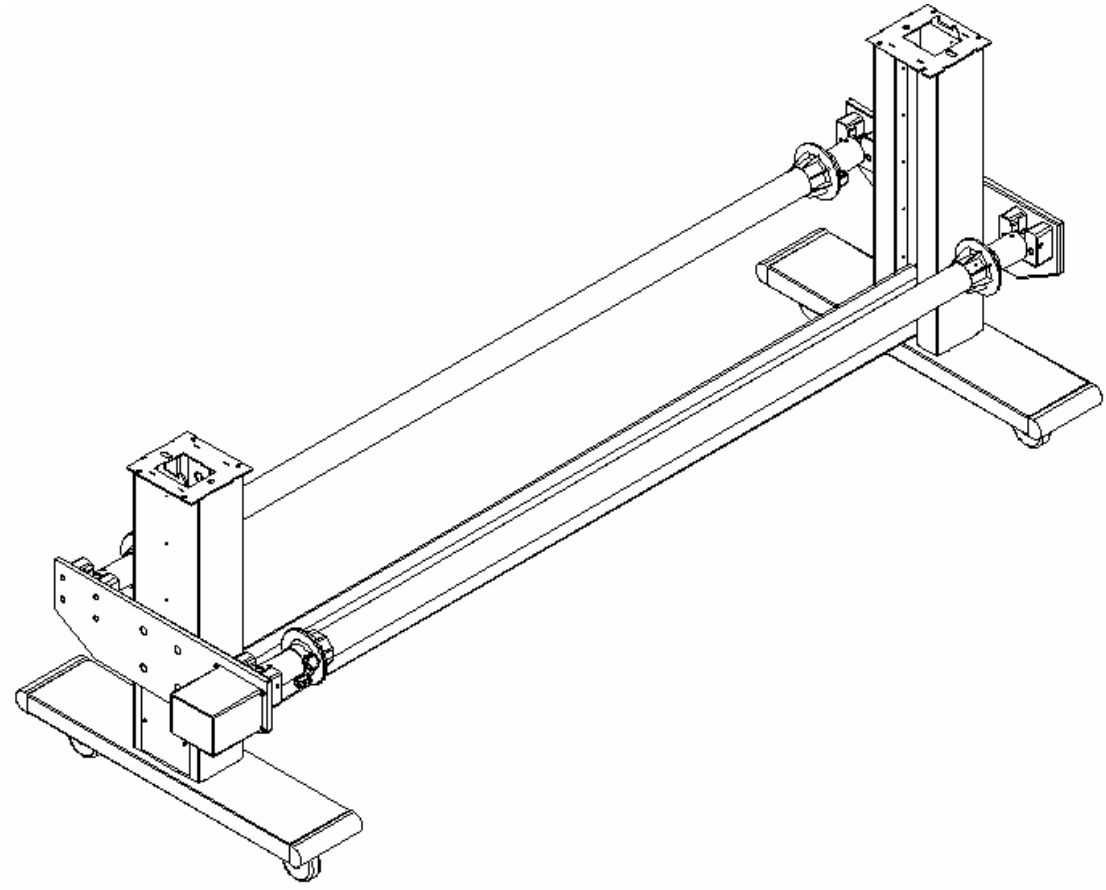
3.1.1 outlook of the printer



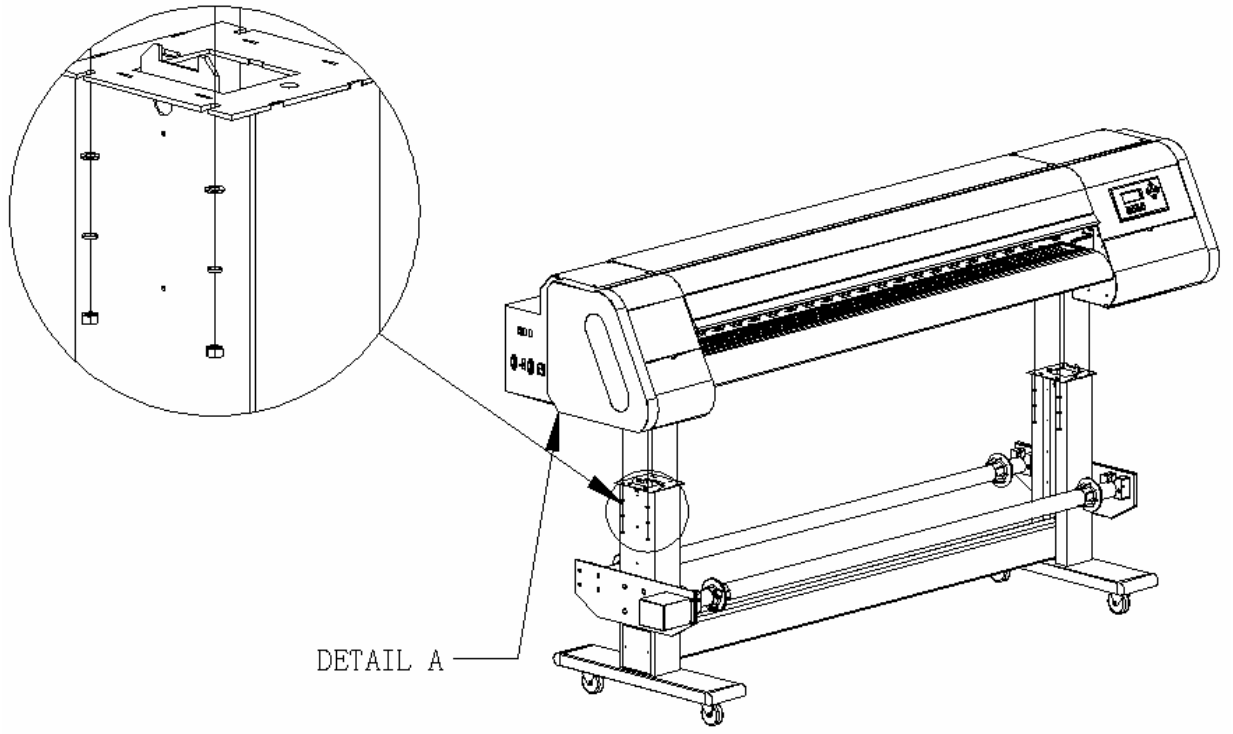
NO.	Part No.	**Description**	Qty	Remark
1	900400010	Printer main body	1	
2	PA5400191	Dry blower bracket	2	
3	KA1400080	Dry blower assy	1	
4	KA6400030	Left stand assy	1	
5	KB2400010	Media take up roll	1	
6	KA0400020	Lower beam assy	1	
7	KG1400020	Waste ink tank	1	
8	KA6400020	Right stand assy	1	
9	KB2400020	Media holding roll	1	
10	K3200020	Main ink tank	4	
11	KB2400060	Tension bar assy	1	
12	KB2400030	Media drive roll	1	

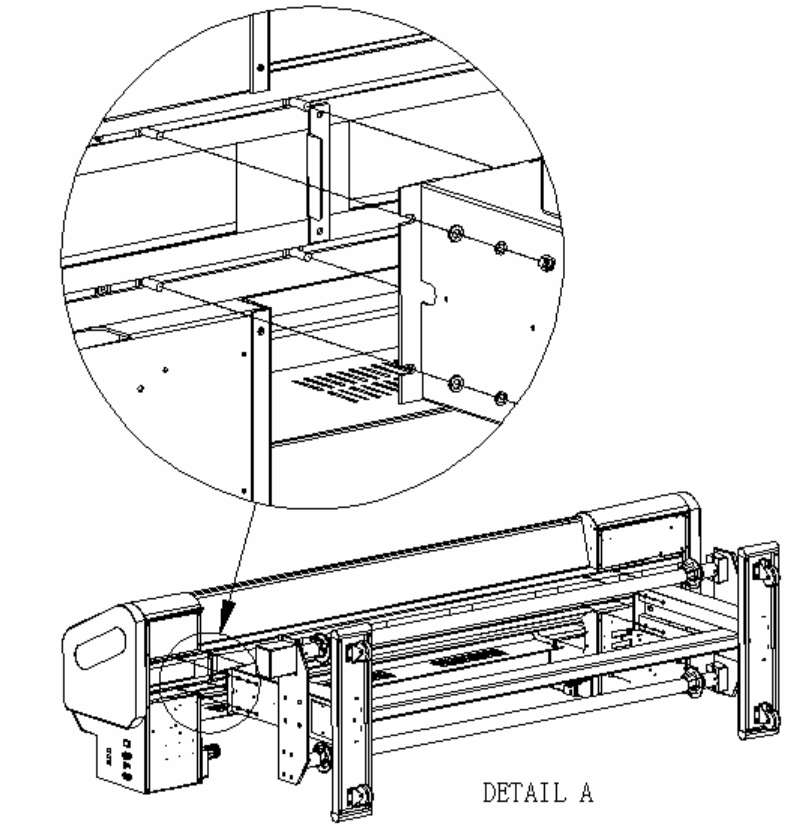
3.1.2 How to install the stand assy



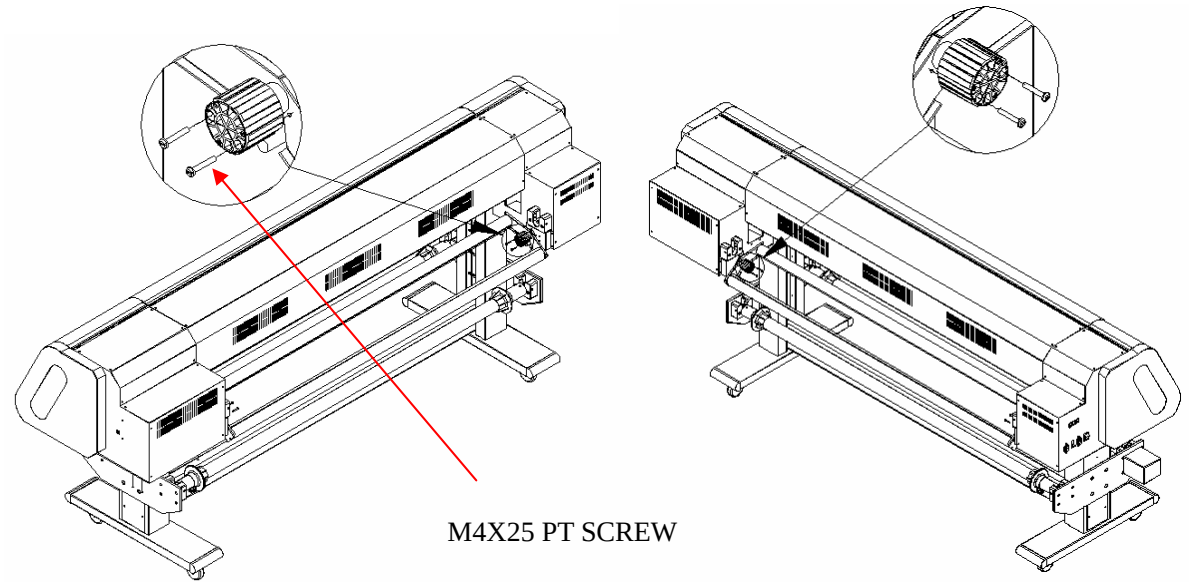


3.1.3 How to install the main body

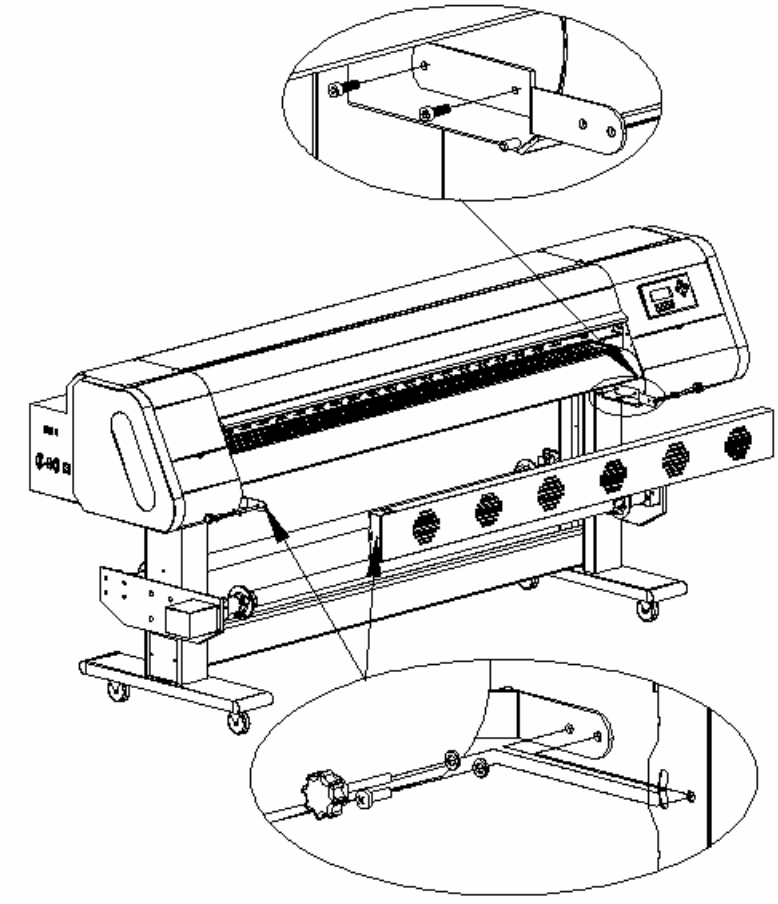




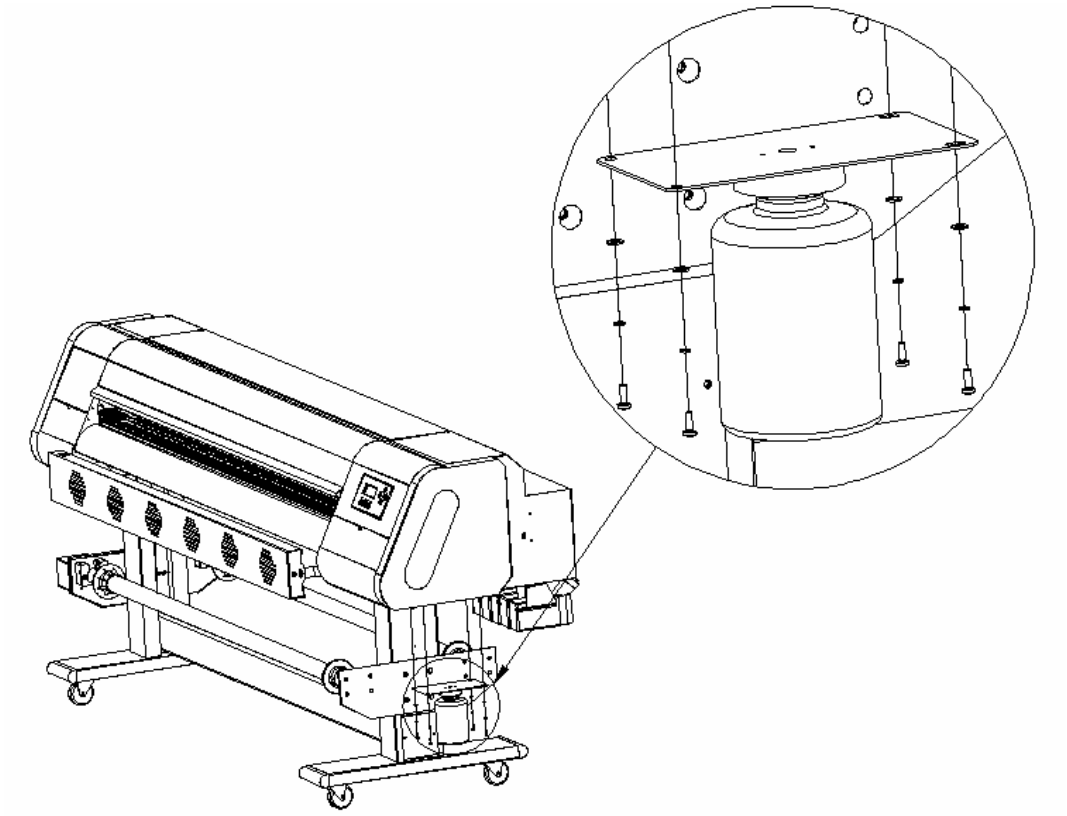
3.1.4 How to install the tension bar assy



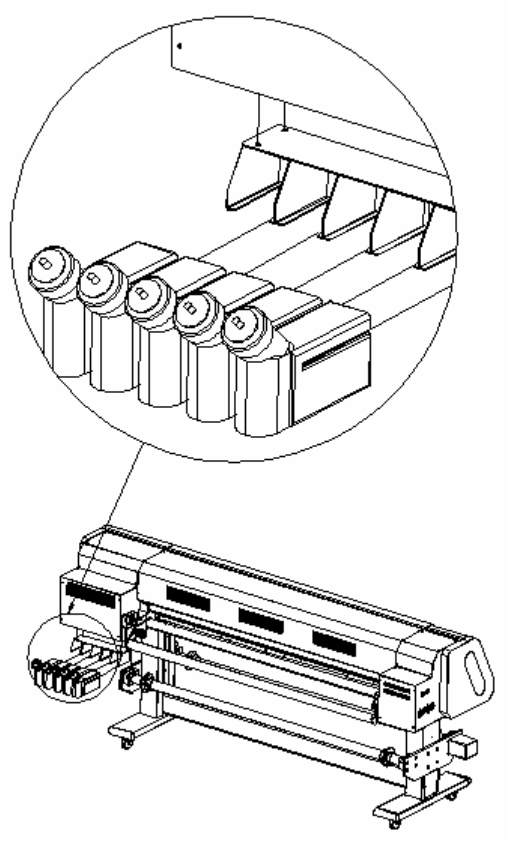
3.1.5 How to install the dry blower assy



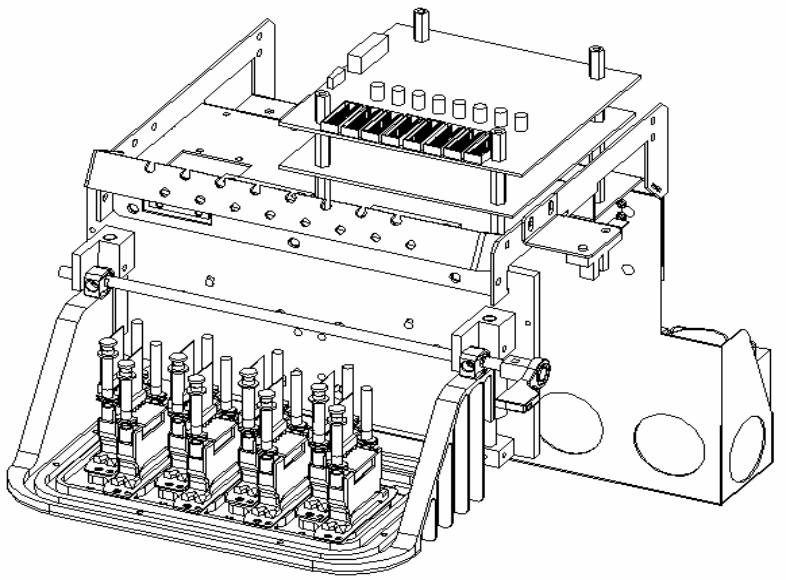
3.1.6 How to install the waste ink tank

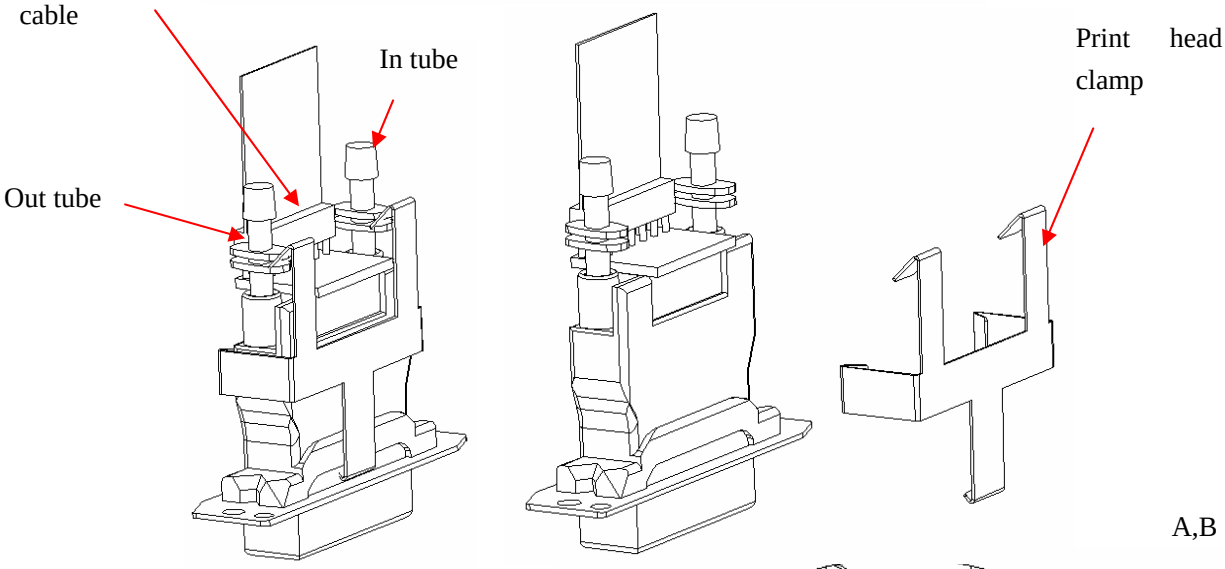


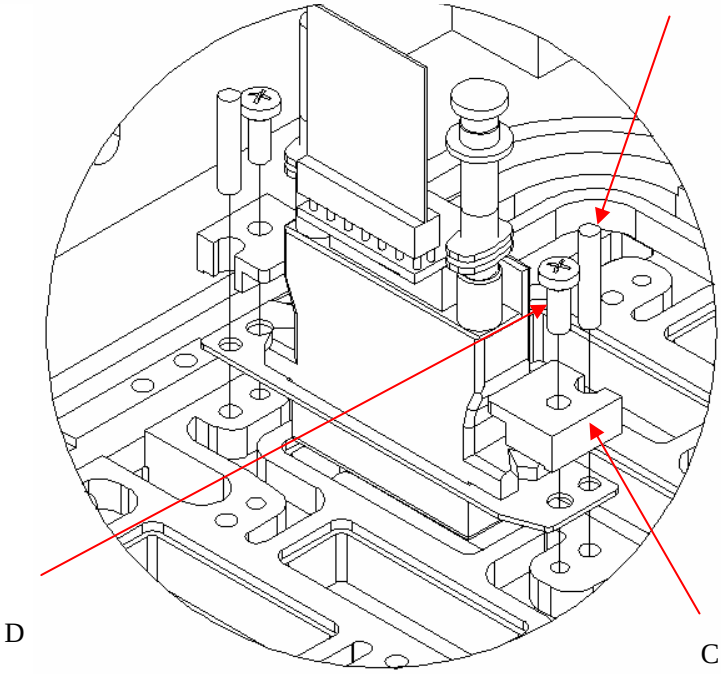
3.1.7 How to install the main ink tank



3.1.8 How to install the print head







Method and Steps:

a. Insert Xaar126/600 print head to the print head frame downwards at first.

b. Insert the print head fixing dowel to the corresponding dowel hole for fixing print head.

c. Put the 2 screws with the Xaar126/600 print head on screw holes, which is on the upper and nether middle part of the frame. （B Location）

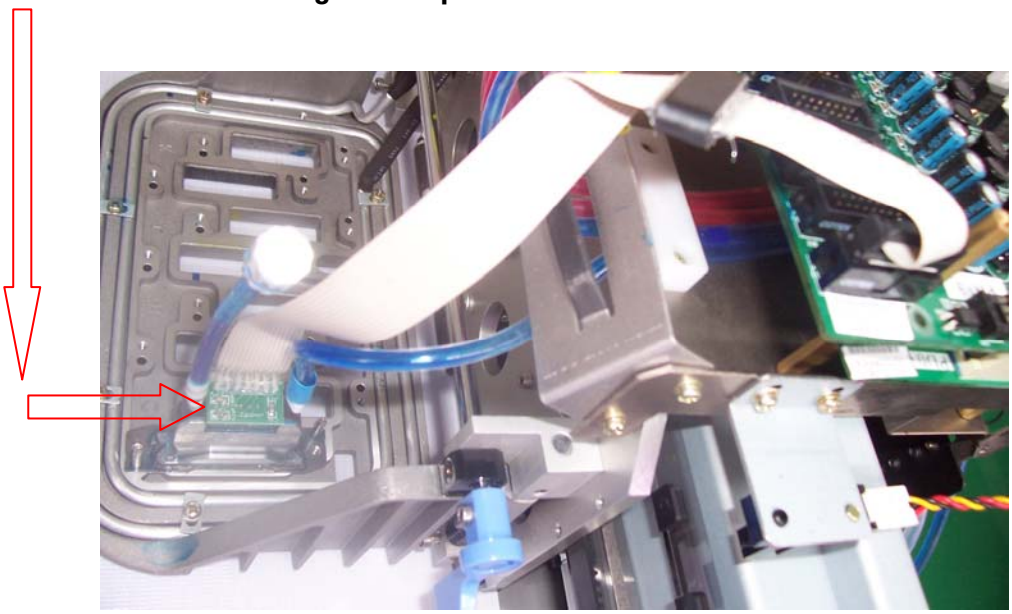
d. Tighten the 2 screws and draw the fixing dowel out of the frame.

3.1.9 How to connect the print head cable.

1. Insert one end of print head cable on the PH control board, and the other end of print head cable is inserted to the print head.

CAUTION:

The connector of the print head and the data cable only have one direction, Please confirm the direction is true before you insert the date cable to the print head connector. Or else it will cause the damage of the print head.



Please connect all of the 8 print head cable based on the right picture

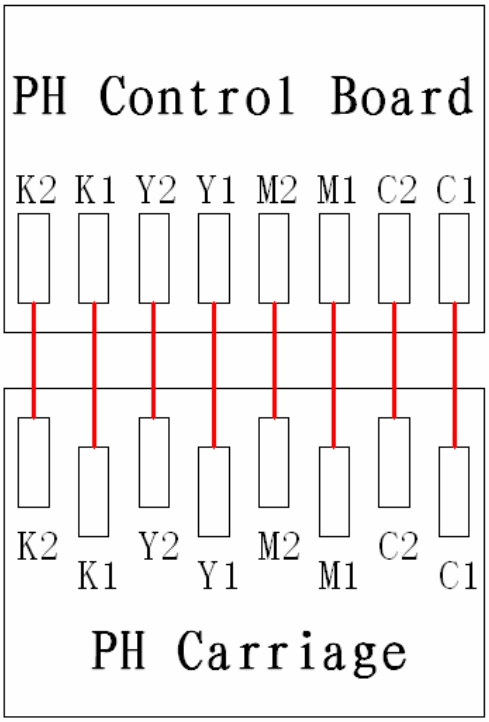


Chart 3-3 Connection of print head cable

3.2 Attention before Turning on the printer

1. In order to clean print head easily, please prepare following items:
   - Flush solution
   - Non-woven fabric.

2. In order to inspect temperature and humidity of printing environment, please prepare relative measurers. Requirement for environment:
   - Temperature: 20°C - 30°C
   - Humidity: 40% - 80%

3. Power supply
   - You may select AC 110V or 220V for different countries or regions.
   - Control power supply: AC 100 - 240V 50/60HZ
   - Heating power supply: AC 100 OR 240V 50/60HZ (AC 100 V optional)
   - Feeding power supply: AC 100 OR 240V 50/60HZ (AC 100 V optional)
   - Please choose the type of power shown on the printer in case of damage to the printer.
   - Make sure the printer is well grounded.
   - It is better to use UPS stable-voltage power.

4. Requirement for computer
   In order to avoid problems caused by computer, please choose high quality computer or brand computer such as DELL or IBM, etc.

3.3 Port of Printer

USB 2.0
Installation:
Connect printer's USB and computer's USB directly.
Find driver for USB at USB Instal File/Try Setup under printer's driver.

3.4 Connect With Power

1. After all the parts installed, move printer to its working area and clean up the package.
2. Connect power cables, including power for printer and heater, printing data cable. Protective switch only works for heater's power. Usually this switch should be at status of On (switch on above, far from red point).
3. After finishing, turn on power. The Auto-ink-supply-system runs to pump ink from main ink tanks to Sub ink tanks.
4. Feed in media and printer enters waiting status.

Then go in test printing. Observe ink drop. If not good, clean print head again.

Chapter 4 Equipment Structure and Accessory

The main components charts of FINA 160A Inkjet Printer list as below:

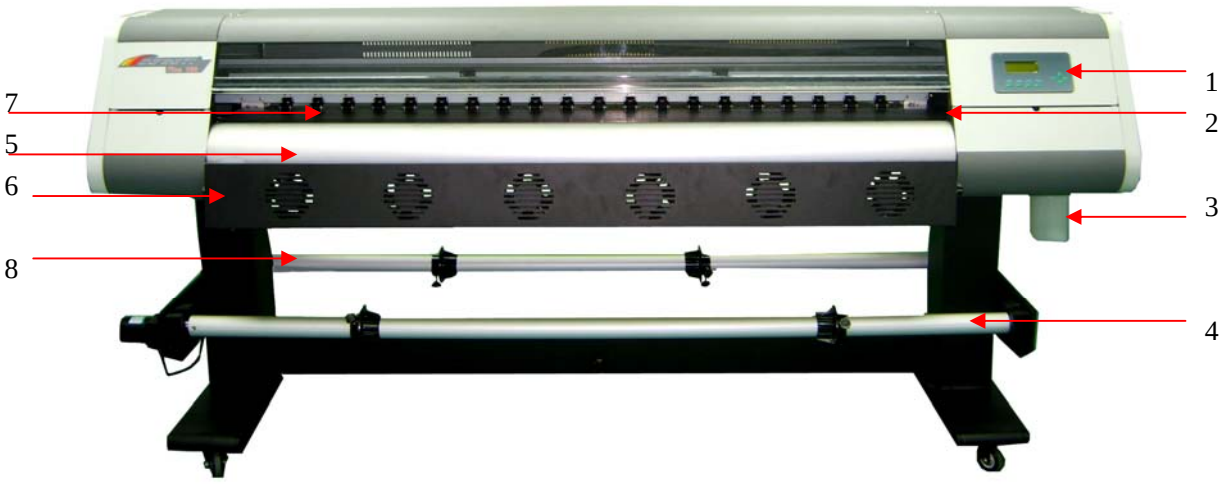


Chart 4-1 Front View of FINA 160 Printer

Chart 4-2 Media feeding system

Chart 4-3 Media feeding and take-up rollers

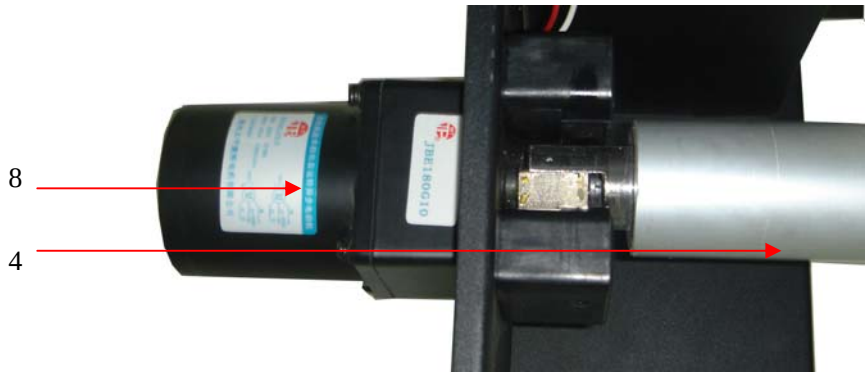


Chart 4-4 Media take-up roller and motor

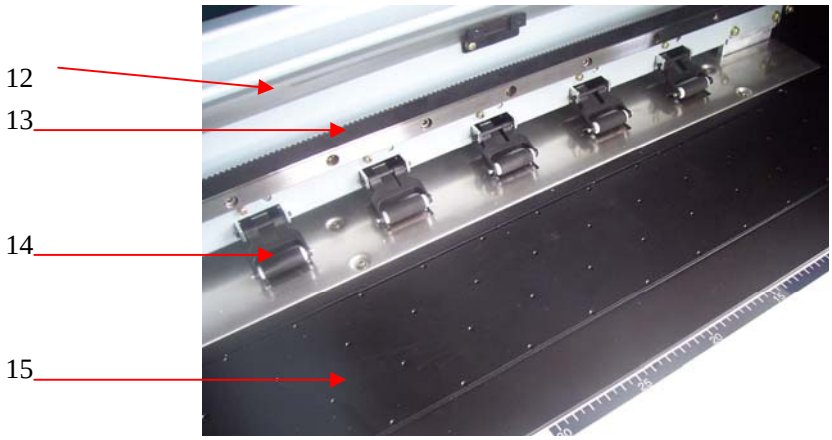


Chart 4-5 Y raster bar and press rollers

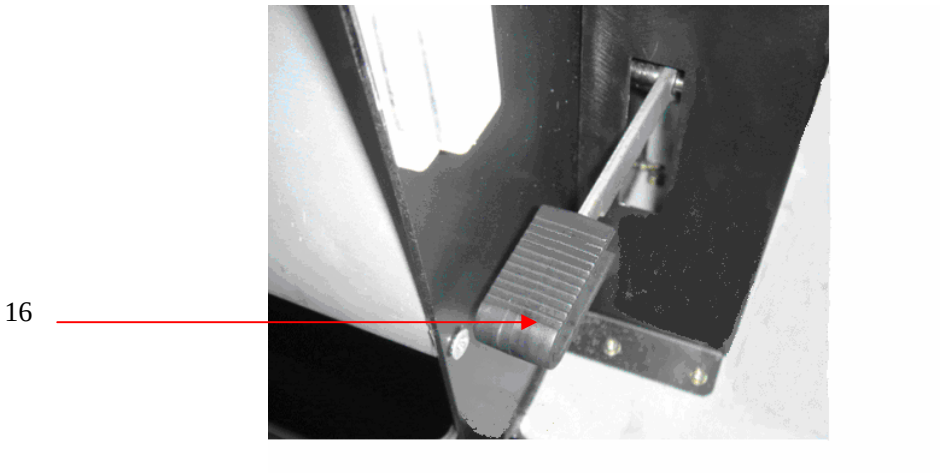


Chart 4-6 Press roller control pole

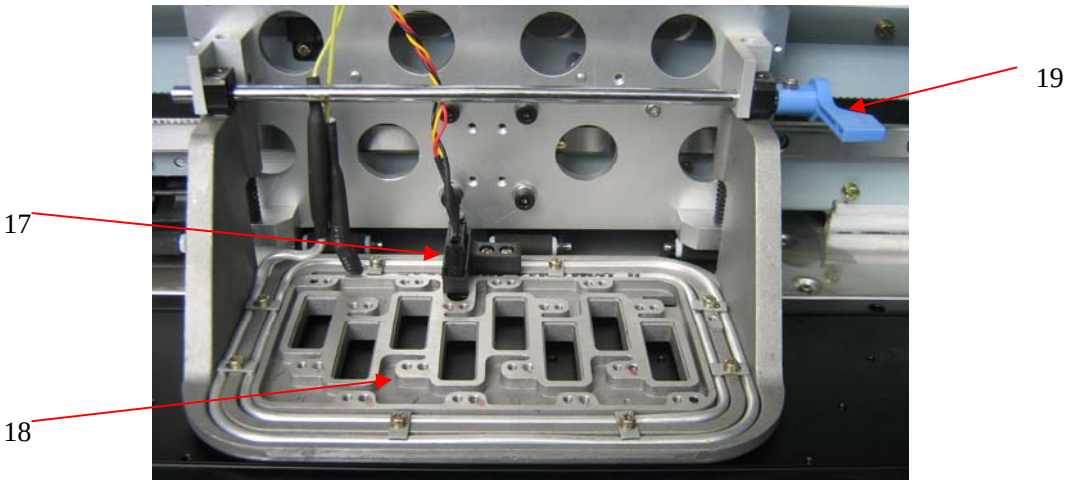


Chart 4-7 print carriage

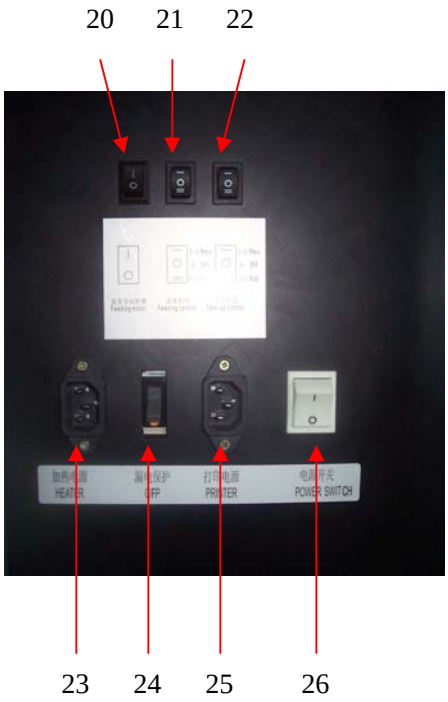


Chart 4-8 switch of the printer

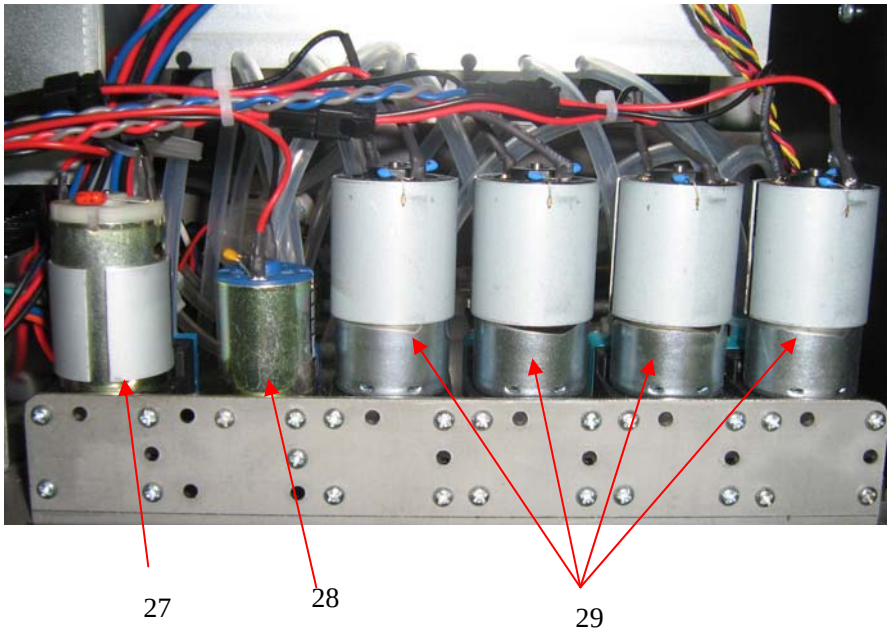


Chart 4-9 pumps

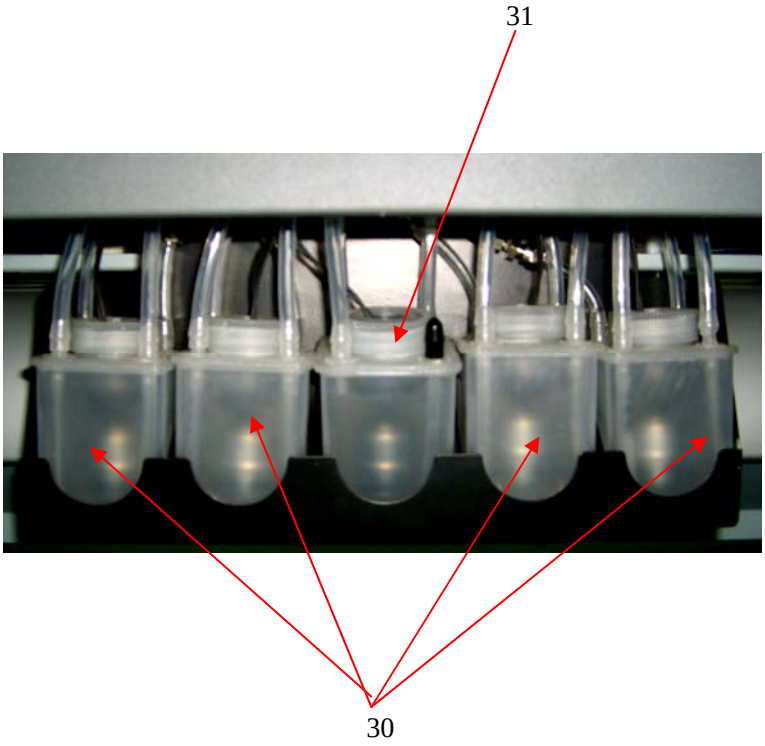


Chart 4-10 Assistant Ink tanks

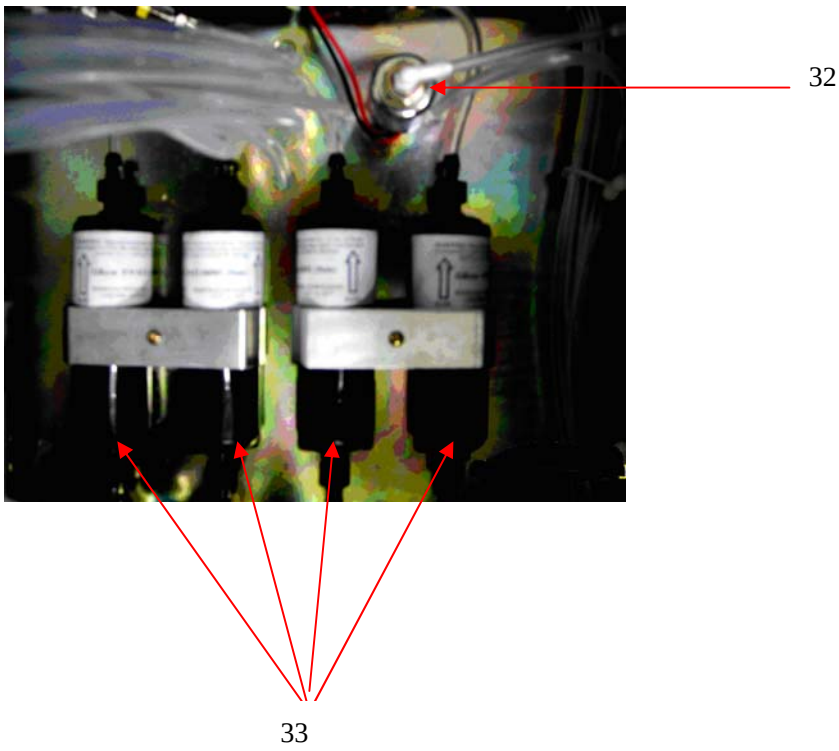


Chart 4-11 Ink filters and valves

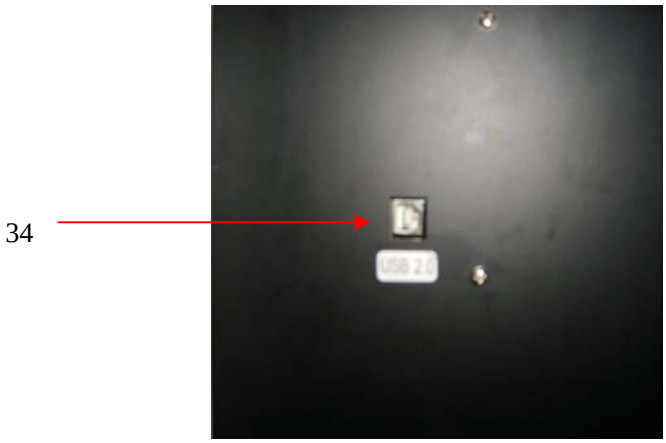


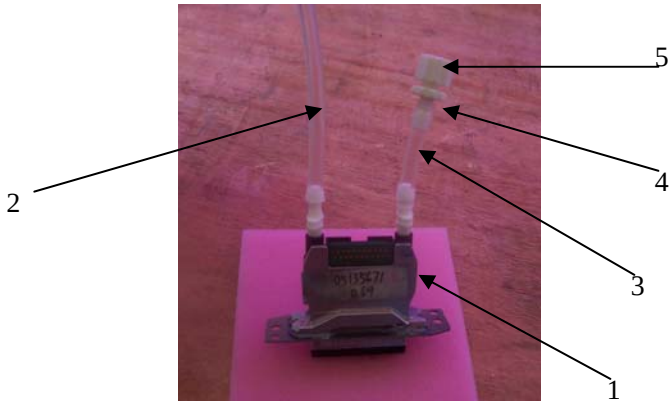
Chart 4-12 Print Interface

Parts on the printer include:

1. LCD Control Panel：Set up and execute function and mode
2. Print Carriage：8 piezo print heads
3. Waste Ink Tank：Collect the waste ink during cleaning
4. Media Take-up Roller：Supporting media for printing
5. Front Heating board：Heat media to dry the ink on the media
6. Fans: Dry the printing media
7. Media hold Roller：Hold media for printing
8. Media take-up motor：Take-up Roller driver
9. Media feeding motor：Feeding Roller driver
10. Media drive Roller: Improve the rubbing strength when feeding media, for feeding media easily
11. Tightening device: Make media tightening and feed media automatically when the signal is detected by media Auto-feeding sensor.
12. Y-raster bar: Take count of print head horizontal moving, so as to insure of Y-direction image precision.
13. Y-strap: Drive print head horizontal moving
14. Pinch Roller：Press media and make media smoothly
15. Printing Platform：Platform for printing
16. Press Roller Control Pole：Control press roller up / down for media feeding
17. Media width detect sensor：Detect the media width
18. Print Carriage：8 piezo print heads installed on it.
19. Print head adjusted pole: Control the print head up and down
20. Media feeding / take-up Selective switch: Control switching between media feeding and take-up
21. Media Feeding System Switch：Make media feeding roller turn forward or backward
22. Media take-up System Switch：Make media take-up roller turn forward or backward
23. Heating Power Socket: Provide power for heater
24. Heater Protective switch：Prevent electric leakage of heating board
25. Power Socket：Provide power for printer
26. Power Switch：Turn on/off printer
27. Air pump: supply air for positive pressure
28. Solution pump: supply clean solution to print head and clean it.
29. Ink pump: provide ink from main tank to sub tank.
30. Sub tank: provide ink to print head.
31. Safety tank: Prevent ink leakage.
32. Valve: Automatically control the air route.
33. Ink filter: Filtrate impurity in ink.
34. Print Interface：USB2.0 interface or connect to data card in computer.

Chapter 5 Usage and Maintains of print head

5.1 Usage of Xaar Print head



1— Print head

2— In tube

3— Out tube

4— Ink tube cap

5— Fitting

Chart 5-1 Print head

1、Flush humectants out of print head

To moisturize print head, lots of humectants are injected into the head before it is used. The humectants must be flushed out for the first using. Before fix the head on the print head frame, do the steps as follows: Joint a filter on the In-tube of the head, and then joint an injector--which fills with flush solution--on the filter. Inject 10-20 ml flush solution to the head to eject the humectants inside. Then fill the head with flush solution to dissolve the humectants completely within 5-10 minutes. Finally, flush the head with about 30ml flush solution to eliminate the humectants completely.

Make sure to operate on a stable and clean platform.

Cautions:

a) Clean platform for convenient operation;

b) Don't touch the surface of head and socket with hand;

c) Clean the filter with flush solution;

d) Connect a tube on the exit of the head to prevent ink flowing into the socket;

e) Don't touch the surface of head with other objects;

f) Be careful to distinguish In tube and Out tube of the head;

g) Eject flush solution from the nozzles with strength no more than 0.3 kg. (It is better to hold the injector with single hand and push it with the same thumb.)

2、Extrude air from the print head”

After fixing the head on the head frame (be cautious of the in tube and out tube). Remove the Cap from the Out tube; positive-pressure clean to fill the head with ink till ink streams out from nozzles. During the process air is extruded completely from the head.

3、Moisturize print head surface

After extruding air from the head, cover the Cap on the Out tube. Positive-pressure clean again until ink streams out of the nozzles, then scrub the head surface with a dry clean stick to form a protecting layer of ink on the head surface. The ink on the surface will stream into the nozzles because of negative pressure.

Notes:

Never scrub the head surface when head surface is dry, for that will orient air into the nozzles and shape bubbles in the pipelines and affect the printing quality.

4、Test printing

Design some color blocks as 20x20cm with some image operating software, and set color luminance as 100%, 50% and 10%. Print the color blocks under test mode and check the print result. If the print result is normal which means no ink-break and no ink spots on the mediums, the printer can work normally.

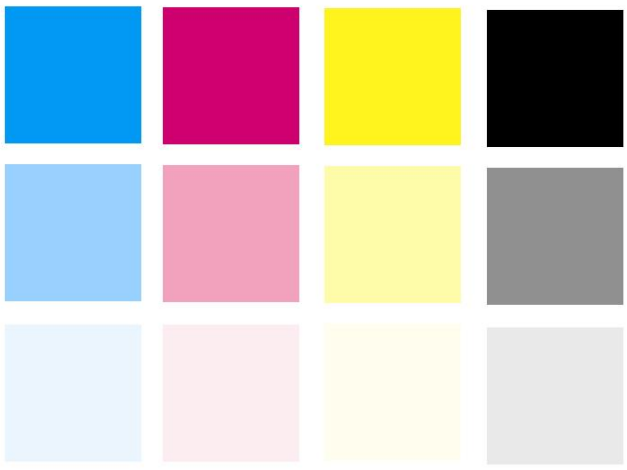


Chart 5-2 color blocks for test printing

5.2 Cleanness and maintenance of the print head

1. Ink replacing

   Flush the print head with the original ink first, and then flush it again with new flush solution, which matches the new ink.

2. Print head cleaning

   If low quality printing takes place, a positive-pressure cleaning is proper for the head. After positive pressure cleaning, scrub the head surface with a dry clean stick to stop ink streaming from the nozzles. Be sure not to use a stick with flush solution to scrub the head surface, otherwise, the flush solution will be siphoned into the nozzles.

3. Flush print head with clean solution

   Please flush all print heads with clean solution if the printers is left unused for more than 3 days. The print head flush method of this printer displays as follows:

   A: Put the three way valve to the clean position.

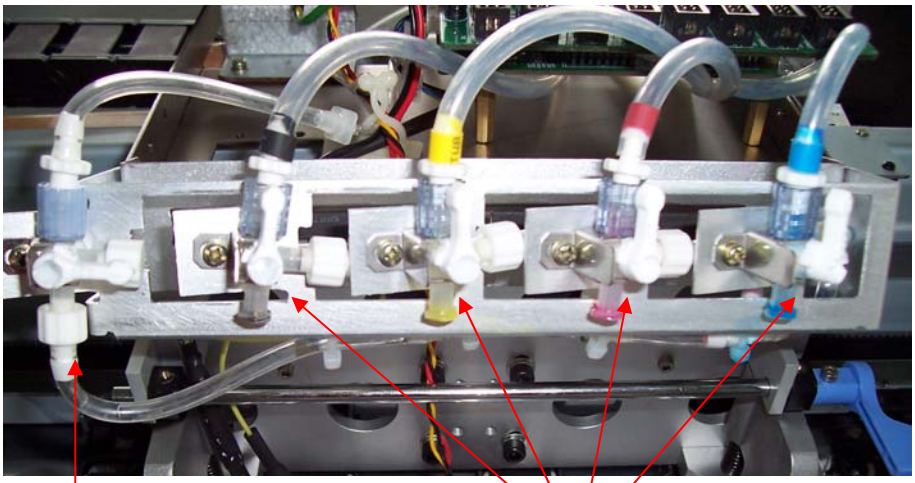
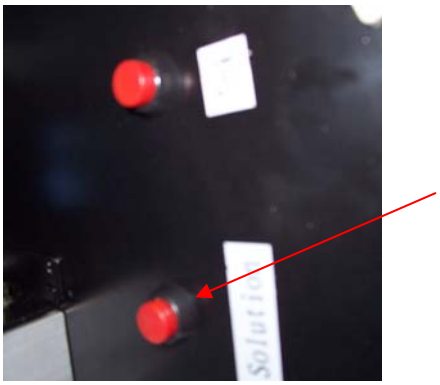


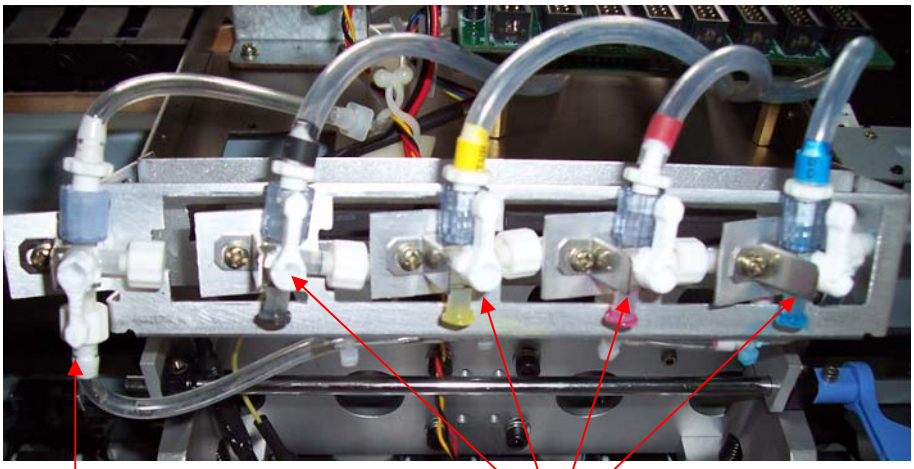
Chart 5-3 clean position of the 3 way valve

B: Push the solution button



After clean all the print heads with the clean solution, please go the third step:

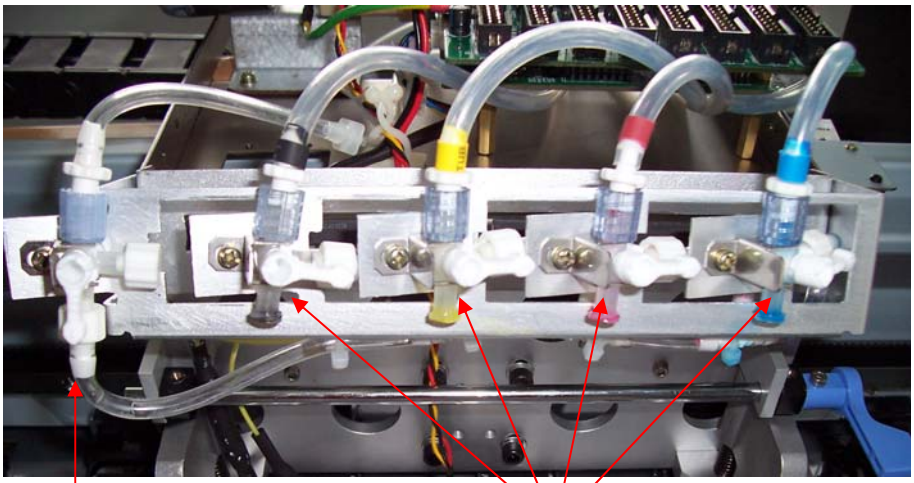
C: Put the three way valve to the hold position.



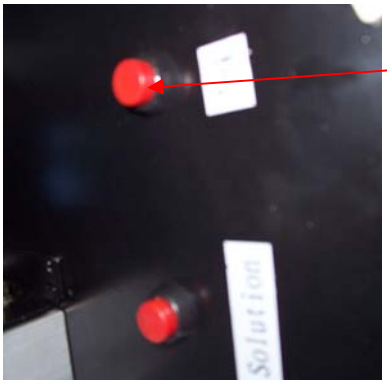
Clean solution channel ON Main ink channel OFF

4. Restart to use the printer.

Please put the three way valve to the printing position if you want to reuse the printer.



Clean solution channel OFF Main ink channel ON

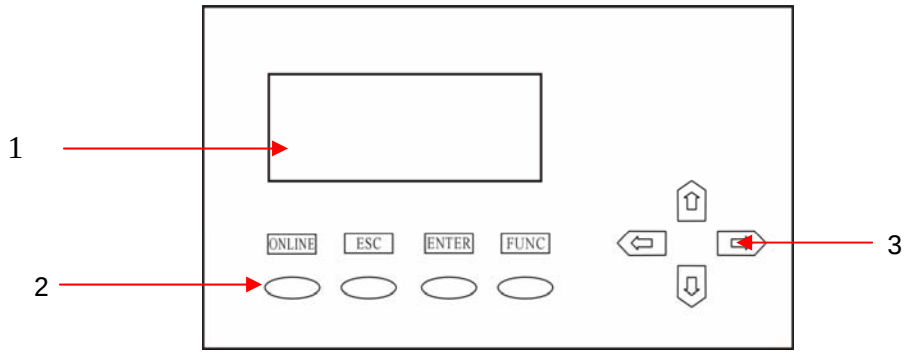


Positive pressure button

Push the positive pressure button and fill the ink to the print head then redo the 5.1 usage of the xaar print head.

Chapter 6 Basic Panel Operation

6.1 Menu Structure of Control Panel



1—LCD
2-- Function Keys
3--Direction Keys
Chart 6-1 Control Panel

6.1.1 Function description of the keys

1、 Direction keys

1） Operation via control panel：

⇧ ⇩ key：Scroll the menus for selection；reduce or increase the values on LCD。

⇦⇨ key：Move the cursor position over the number string on LCD。

2） When the printer is waiting：

⇧ ⇩ key: Move the media forward and backward；

⇦⇨key: Move the p/h carriage to cleaning position for cleaning and move it back to original position after cleaning。

2、Function keys

1) **ONLINE**：Switch the printer online and offline / press down and hold it for several seconds to pause printing。

Waiting…
Online

2) **ESC**：Cancel operation and return to up-level menu。

3) **ENTER**：Confirm and execute the operation。

4) **FUNC**：Shift to special function；Combine with ⇦ key to test print when the printer is waiting。

3. Basic operation

After power on the printer, the system executes X and Y motion test and p/h test.

Booting	>System
	>Y Motor
V1.10	>X Motor
Check	—>Print head

After self-test, the system moves the p/h carriage back to original position. The LCD displays printer model and version number and then shift to basic operation menu shown as below. That stands for the printer is ready.

Menu	1. Ink Status	+
	2. Heat Status	+
	3. Cleaning Tool	+
Offline	4. Print para	+

6.1.2 Menu structure

Menu structure includes main menus and sub menus. Main menus followed by "**+**" s have sub menus inside. Submenus followed by "—" s have no lower level inside.

Main menu includes items as below:

—> 1. Ink Status +
2. Heat Status +
3. Cleaning Tool +
4. Print para +
5. Application +
6. Engineer Set +

Press ⇧ ⇩ key to scroll the menus upward and downward. Press **ENTER** to unwrap submenus. For example, while the arrow points to "**1. Ink Status**", press **ENTER** to unwrap the submenu. LCD displays details of submenu **M1** as below:

Menu →	Ink Status
M1	Ch A C M Y K c m
	Rn _ _ _ _ _ _ _
Offline	Al _ _ _ _ _ _ _

On the LCD, **M1** stands for this submenu under main menu No.1. Here press **ESC** key, it returns the display to main menu.

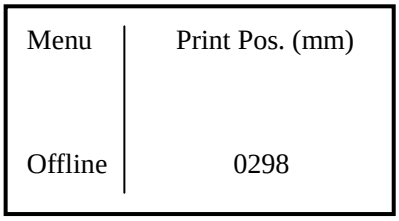
Arrow points to the first line on the LCD. Scroll the submenus by pressing ⇧ and ⇩ key same as main menu. The submenu followed by a "—" means has no lower submenu inside. Press **ENTER** key to execute the operation. Here press **ESC** key, operation will be canceled.

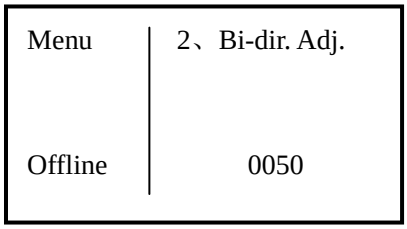
6.2 Function Description in Details

Main menu	Submenu	Function description
1. Ink Status	Ink Status Ch A C M Y K Rn _ _ _ _ _ _ _ Al _ _ _ _ _ _ _	Ink status displays. The LCD display details as below: Menu / Ink Status Ch A C M Y K Rn _ _ _ _ _ _ _ Offline / Al _ _ _ _ _ _ _ Item **Ch**: stands for ink channels. A means all channels; Item **Rn**: displays ink supply status of corresponding channel; Item **AL**: displays ink lack alarming of corresponding channel; Press **ENTER** to refill ink and cancel alarming. **For 4 colors and 8 print heads supplying ink and no safety tank in this printer, one of "C, M, Y, K" on the LCD flashes in low ink status and "A" is still.**
2. Heat Status	Heat Status FH Pre P/H Tem 00 00 00 Set 00 00 00	Heating status displays. The LCD display details as below: Menu / Heat Status FH Pre P/H Tem 00 00 00 Offline / Set 00 00 00 Item **Tem**: displays actual temperature; Item **Set**: displays setup temperature. **FH** means front and rear heater **Pre** means middle plate heater **P/H** means print head heater

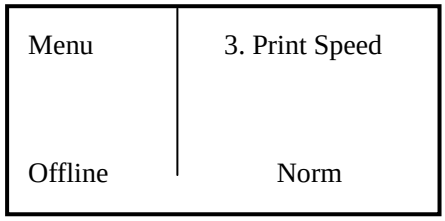
<table>
<tr><td rowspan="6">3. Cleaning Tool</td><td>Firing</td><td>The LCD display details as below:
<table><tr><td>Menu

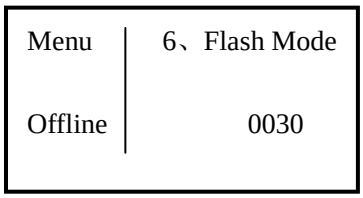
offline
Offline</td><td>1. Firing -
2. Jam Test -
3. Clean Post -
4. Home Post
5. Clean
6. Clean heavy</td></tr></table>
Press ENTER key to execute the operation, “Busy” flashes on the LCD. P/Hs spray downward to prevent nozzle clogs. The LCD stops flashing after firing finishes.
Press ENTER key again to execute P/H firing one more time if necessary.
The volume of ink fired should be set in submenu Firing Vol under menu Print Para.</td></tr>
<tr><td>Jam Test</td><td>Press ENTER key to execute the operation of test printing.</td></tr>
<tr><td>Clean Post</td><td>Press ENTER key to execute the operation of moving P/H carriage to left capping position and waiting for cap the print head.</td></tr>
<tr><td>Home Post</td><td>Press ENTER key execute the operation of returning the P/H carriage to original position.</td></tr>
<tr><td>Clean</td><td>Press ENTER key execute the operation of a total auto clean process one time. Please see 8.4.1 for detail.</td></tr>
<tr><td>Clean heavy</td><td>Press ENTER key execute the operation of a total auto heavy clean process one time. Please see 8.4.2 for detail.</td></tr>
</table>

<table>
<tr><td rowspan="2">4. Print Para</td><td>Print Post</td><td>The LCD display details as below:
 

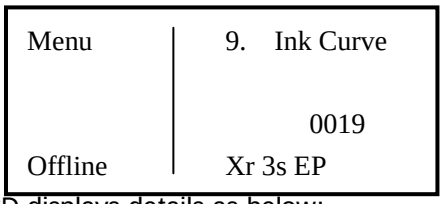
Number string “XXXX” flashed on the LCD. Here press ⇦ and ⇨ key to move the cursor position over the number string and press ⇧ or ⇩ key to increase or reduce the value of the flashing number. Press ENTER to save the number as print position. Images and test print start from this position.
Here press key combination FUNC + ⇧ or ⇩ key to move the media forward or backward; press key combination FUNC + ⇦ key to move the P/H carriage to printing position It will tell the position set well or not. Press any key to return the P/H carriage to original position.</td></tr>
<tr><td>Bi-dir. Adj</td><td>Press ENTER key and the LCD displays as below:
 

This function is used to adjust bi-direction printing to ensure bi-direction printing quality.</td></tr>
</table>

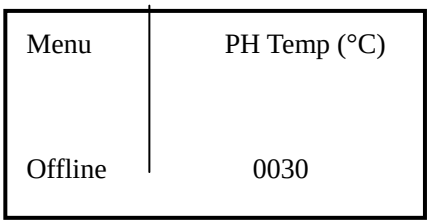
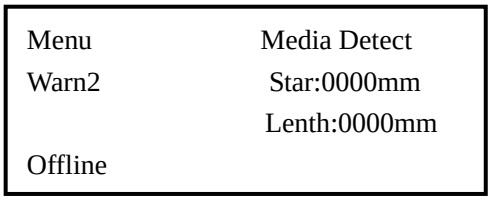
	Print Speed	This function is used to adjust the scan speed of the P/H carriage. The LCD displays details as below:  Press ⇧ or ⇩ key to select from the 3 options. **High** scan speed will reduce printing quality. **Low** scan speed will increase printing quality but reduce printing speed. The suggestion is **Norm**.
	Feed Speed	The LCD displays details similar to Print speed. "**Norm**" flashes as the default option. Press ⇧ or ⇩ key to select from the 3 options. The suggestion is "**Norm**".
	Firing Vol	"XXXX" flashes on the LCD. Press⇧ or ⇩ key to increase or reduce the value by 1. The default value of Firing Vol is 20. This value is the firing volume of P/Hs for auto spray and printing after cleaning (that means all nozzles are unclogged).

	Flash Mode	Numbers are used for flash mode setting: **0** stands for P/H does not flash during printing; The LCD displays details as below:  When the value is 1, it stands for pint head flashing in original position after printing 1Pass; When the value is 2, it stands for pint head flashing in original position after printing 2Pass; ... ... When the value is 30, it stands for print head flashing in original position after printing 30Pass; The biggest value can reach to 30.

	PH Volt. Set	This function is used to set Voltage of P/Hs. The LCD displays details as below: Menu / Offline 1 PH 1 Voltage 2 PH 2 Voltage 3 PH 3 Voltage 4 PH 4 Voltage 5 PH 5 Voltage 6 PH 6 Voltage 7 PH 7 Voltage 8 PH 8 Voltage In this printer, print head 1, 2 stand for C color print head; print head 3, 4 stand for M color print head; print head 5, 6 stand for Y color print head; print head 7, 8 stand for K color print head. Go on pressing **ENTER,** the LCD shows: Menu / Offline 1 PH 1 Voltage 0068 0137 The upper numbers "**0068**" stands for the setting EF value 0.68 of C color print head. And the nether numbers "**0137**" stands for the real voltage value 13.7V of C color print head. Here press ⇧ and ⇩ key to scroll the submenu. Then press **ENTER** key to change the PH1 voltage value. The method of changing other PHs voltage is the same as upper.

<table>
<tr><td rowspan="3">5. Application</td><td>Curve of ink</td><td>Select ink curves and ink curves shows relations between voltage and temperature.
 

LCD displays details as below:
□□ □ □ □□□□
1 2 3 4
The name of ink curve indicates as below：
1、SK: Stands for SKIEO print head
Xr: Stands for Xaar print head
Sp: Stands for Spectra print head
2、2：Stands for 200 dpi print head；
3：Stands for 300 dpi print head；
3、S：Stands for solvent based ink type；
O：Stands for oil based ink type；
U：Stands for UV ink type
4、ink name
The ink curves are different with different ink types. For using Xaar126 print head and solvent ink in this printer, so the ink curve showing on the LCD lists as upper.</td></tr>
<tr><td>Front Heater</td><td>Used for setting temperature of front and rear bedplate.
“XXXX” flashes on the LCD. Press ⇧ or ⇩ key to increase or reduce the value of temperature. And the bigger value is, the higher temperature is. The highest temperature can reach to 55°C.</td></tr>
<tr><td>PreHeater</td><td>Used for setting temperature of middle bedplate.
“XXXX” flashes on the LCD. Press ⇧ or ⇩ key to increase or reduce the value of temperature. And the bigger value is, the higher temperature is.</td></tr>
</table>

	PH Heater	 Used for controlling print head temperature in printing. LCD shows as the upper chart. “XXXX” flashes on the LCD. Press ⇧ or ⇩ key to increase or reduce the value of temperature. And the bigger value is, the higher temperature is.
	Media Detect	Press **ENTER** to execute the operation, the LCD displays OFF means the function is switch off when the printer is waiting. **OFF**（function switch off） Press ⇧ or ⇩ key to switch on the function. **ON**（function switch on） Pull up the press pole and then pull it down, the LCD displays details as below:  Press **ENTER** key to start media edge detecting. Press ESC to cancel the operation. After detecting, “**OK**” displays means the detecting is successful and saves the result as print position, which should add the value of offset set at below step. “**Error**” displays means the detecting is failed and the value of print position does not change. **(This function is optional)**

	Margin	"XXXX" flashes on the LCD. Press ⇧ or ⇩ key to increase or reduce the value. This value added to the value of media detecting is saved as the value of print position.
	Fan velocity	This 0-10 value denotes the ten steps of the media negative fan speed. 10 is the fastest
	T Neg. Pressure	**This function is null for the moment.**
	UV Lamp power	**This function is null for the moment.**
6. Engineer Set	Clean Post	Set the distance from original position to cleaning position. P/H moves to cleaning position and waiting cap the P/H. (It's better not to change this value once set by the technician.)
	Printer Width	Set the biggest distance in scanning direction. (It's better not to change this value once set by the technician.)
	Moving Test	Press **ENTER** to execute the operation. The LCD displays details as below: Menu | Moving Test Offline 0000 And P/H carriage moves back and forth to simulate printing, but P/H not spray. It's used for mechanical test. The number on the LCD indicates times the P/H carriage moves back and forth.

	Default Set	Reset the parameters to default setting. Press key combination of **FUNC+ENTER** to execute the operation.。 (It had better not to execute this operation except for the technicians.)
	Y Test Speed	It is used for speed test of Y motion. (It had better not to execute this operation except for the technicians.)
	X Test Speed	It is used for speed test of X motion. (It had better not to execute this operation except for the technicians.)

EF value setting

Each Xaar126/600 head has its own EF value. Manufacture always provides a standard EF value, which is captured under standard condition. Users input this value at column Voltage. Usually, the printing effect is good. The value is marked on the head. User should write down the EF value before you install the PH then put the value into the setting of the main board(See menu tree “print pare” “PH Volt.set”)

If the voltage is too high, it produces the satellites and ink supply is easy to break； If the voltage is too low, the printing line is not straight and easy to have an angle. Besides, ink volume is small and output color is light. Therefore, every head has its optimal EF value. When adjusting, you can adjust the EF value one by one. Usually user needn’t to adjust EF value.

Note:

When install print head, select the 2 with same or similar EF value for 1 color, or it will cause different color of front and rear print heads.

6.3 Printing Steps

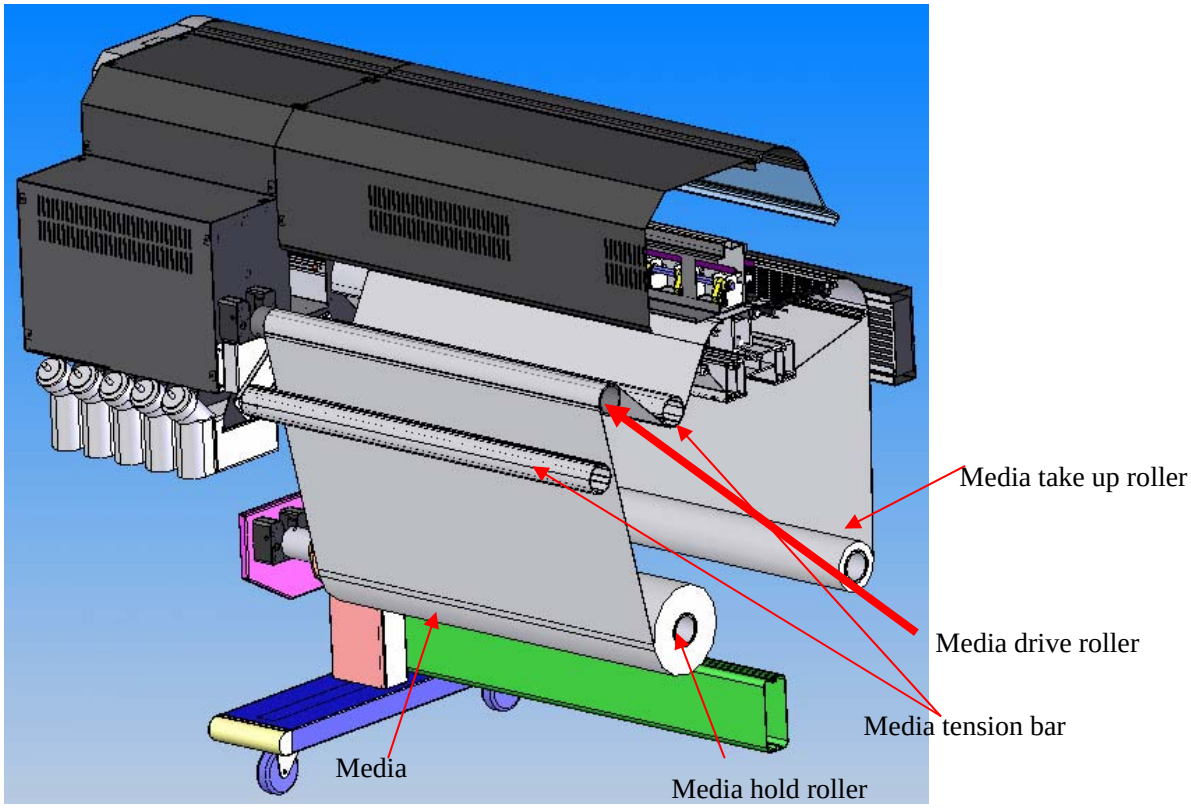
On normal condition, the steps are as follows:

1. Power on the printer.
2. Turn on the computer.

Note:

It is recommended to turn on the printer before computer. Otherwise the connection may fail.

3. Install media.



4. Clean the head and start the self-diagnosis till no nozzle clogging.
5. Press ONLINE.

Menu	1. Ink Status	+
	2. Heat Status	+
	3. Cleaning Tool	+
Offline	4. Print para	+

Offline mode

ONLINE
MODE

Online mode

Chart 6-2 Online and offline Mode

6. Trim the pattern for printing, and save it in computer.
7. Open RIP.
8. Create new file.

9. Read the pattern for printing.
10. Adjust the position, size, property, and resolution of the pattern.
11. Printer setting

1) Select File/Printer setup. Below dialogue box shows:

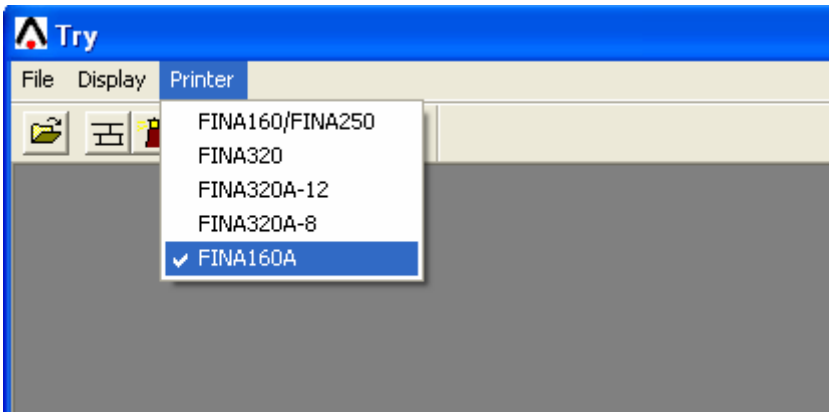


Chart 6-3 Printer Setup dialog box

2) Select the type of printer as “Aprint” and the model as “8160X+”

3) Click the “Printer setup”. Set the relevant value in the following dialogue box.

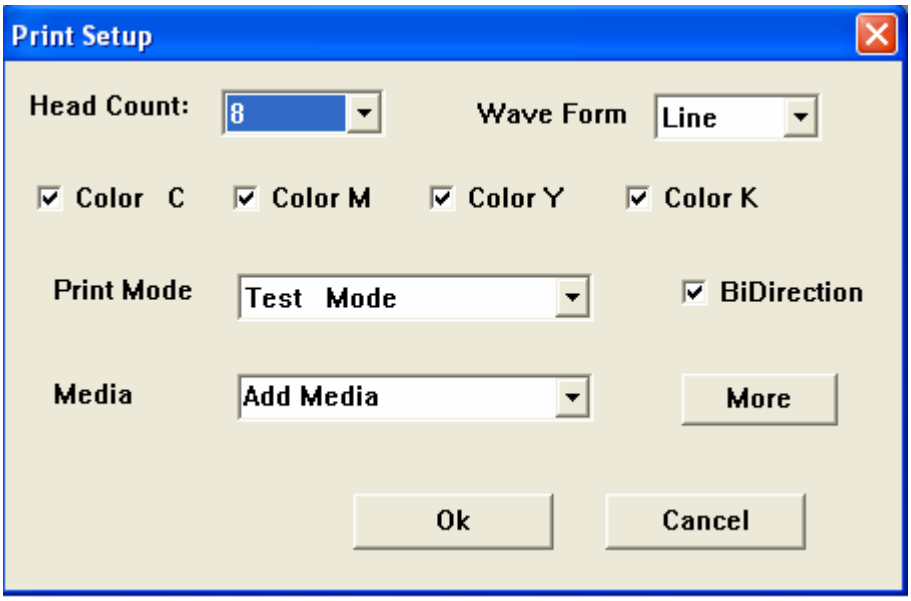


Chart 6-4 Print setup dialog box

a. Select the printing resolution.

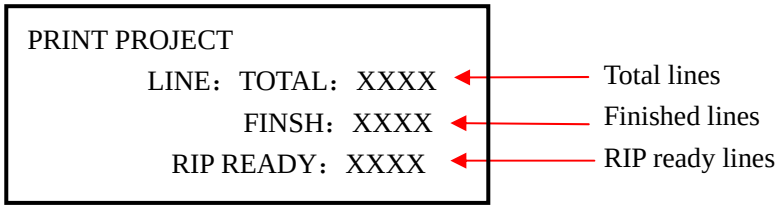
b. Select BID or single direction printing. BID has higher efficiency than single direction.

4) Click “color tune” to activate following dialogue box.

Note:

Details of the functions above and others referred to the *GRAPHTEC RIP Manual*

12. Click “Printing Project” to print.
13. LCD displays as below when printing:



14. If clogging appears during the printing，press ONLINE for a longer time (3s) to pause printing for print head cleaning. After cleaning, press ONLINE to go on printing.

Cleaning procedure during printing:

If you find print heads clogged during printing, press and keep **ONLINE** button to pause printing. Select "**Auto clean**" in menu and press "**ENTER**" key, the system presses ink 2 seconds and stops 1 second automatically. Then cycles once. The pressing ink time in the whole process is 4 seconds. Scrub the head surface with a clean stick after ink not dropping from print holes. After accomplishing cleaning 5 or 10 minutes later, Press **ENTER** key to continue printing. Press **ESC** key to cancel the printing.
Do not switch mode from **ONLINE** to **OFFLINE** until "printing cancel" shows up on computer.

15. Press ONLINE when the printing is all finished. Then the printer is under the Offline mode.

Note:

To cancel printing operation, usually do in RIP. If you want to cancel printing directly on the printer, press ONLINE button after the menu "printing cancel" appears in software.

Chapter 7 Ink Supply System

7.1 Summary

This ink supply system can control automatically several pumps at the same time and provides protect function. Isolated ink supply system is easy for operation.

7.2 System Diagram

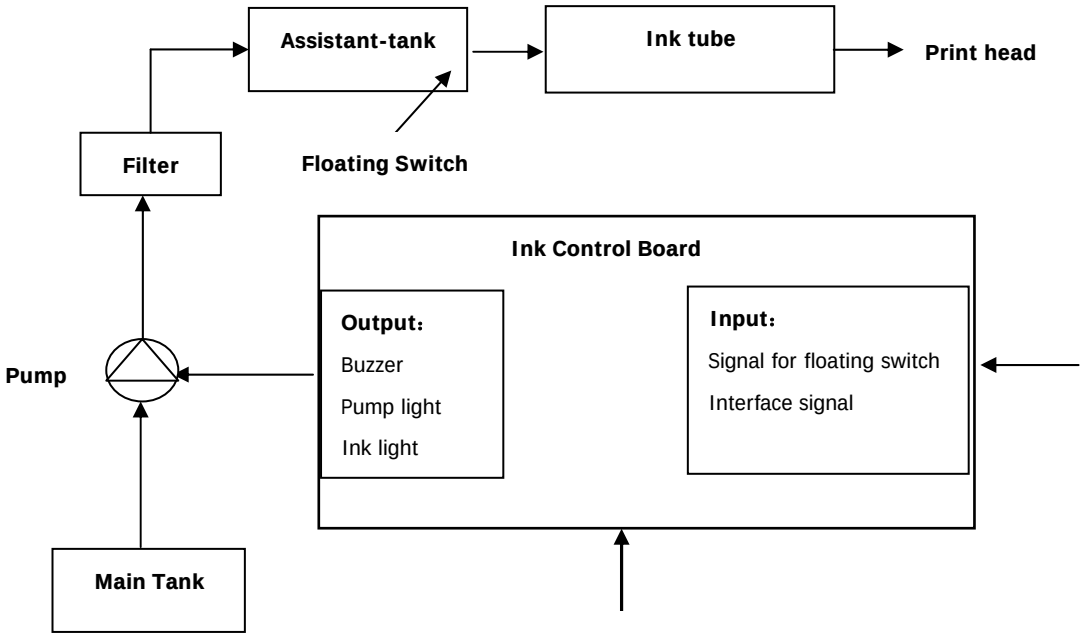
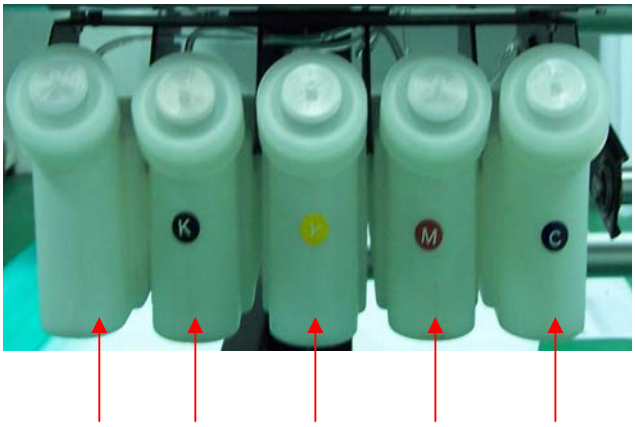


Chart 8-1 Ink supply and cleaning system Diagram

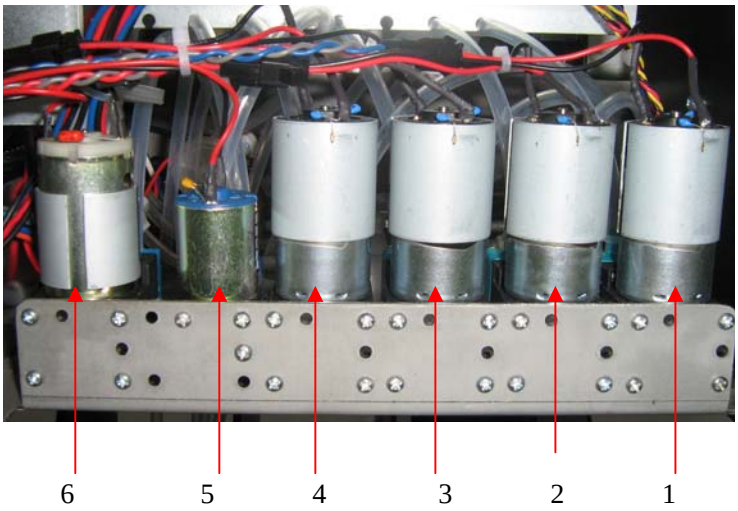
7.3 Structure

The ink supply and cleaning system consist of ink tanks, ink pumps, print filters, sub tanks, print head, control board and etc. The components charts displays as below:



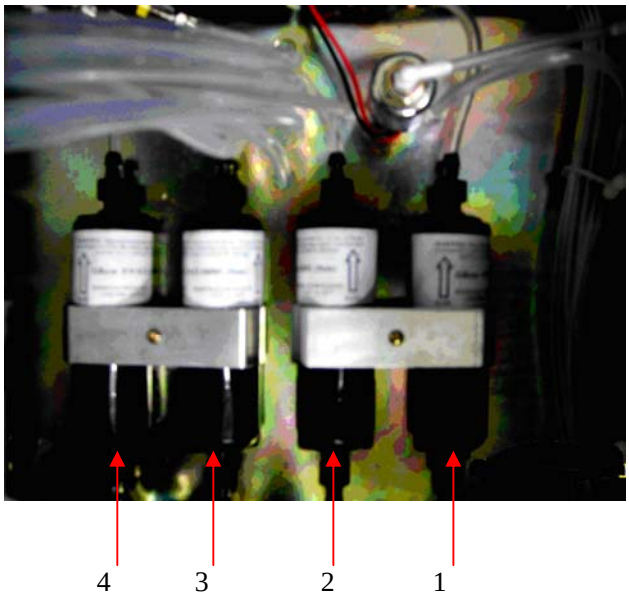
1. main Ink tank C
2. main Ink tank M
3. main Ink tank Y
4. main Ink tank K
5. main Ink tank solution

Chart 7-3-1 Ink tanks



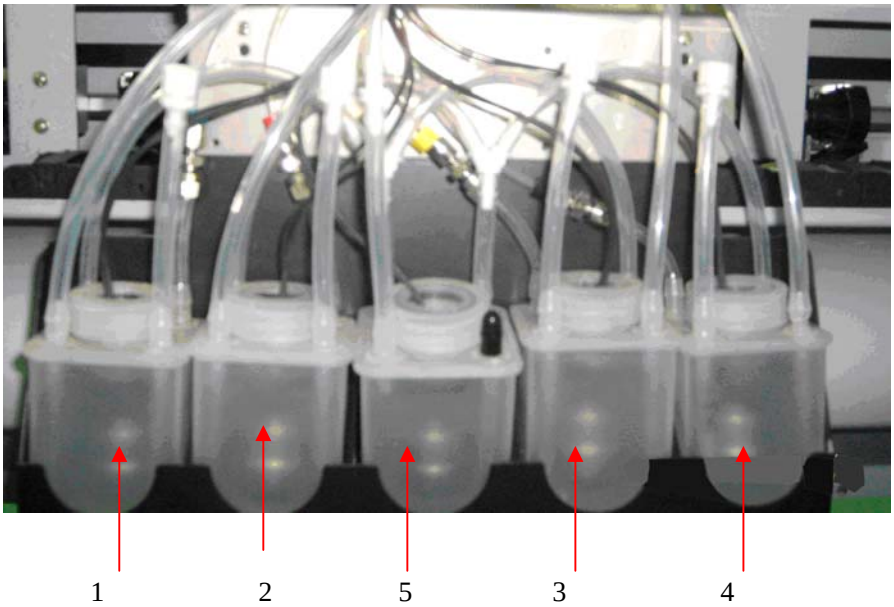
1. Ink pump C
2. Ink pump M
3. Ink pump Y
4. Ink pump K
5. Solution pump
6. Air pump

Chart 7-3-2 Ink filters and pumps



1. Ink filter C
2. Ink filter M
3. Ink filter Y
4. Ink filter K

Chart 7-3-3 Ink filters



1. Assistant ink bottle C
2. Assistant ink bottle M
3. Assistant ink bottle Y
4. Assistant ink bottle K
5. Safety bottle

Chart 7-3-4 Assistant ink tanks

Assistant and ink supply Board has many functions. It can control ink supply, cleaning and heating. The chart of assistant board lists as below:

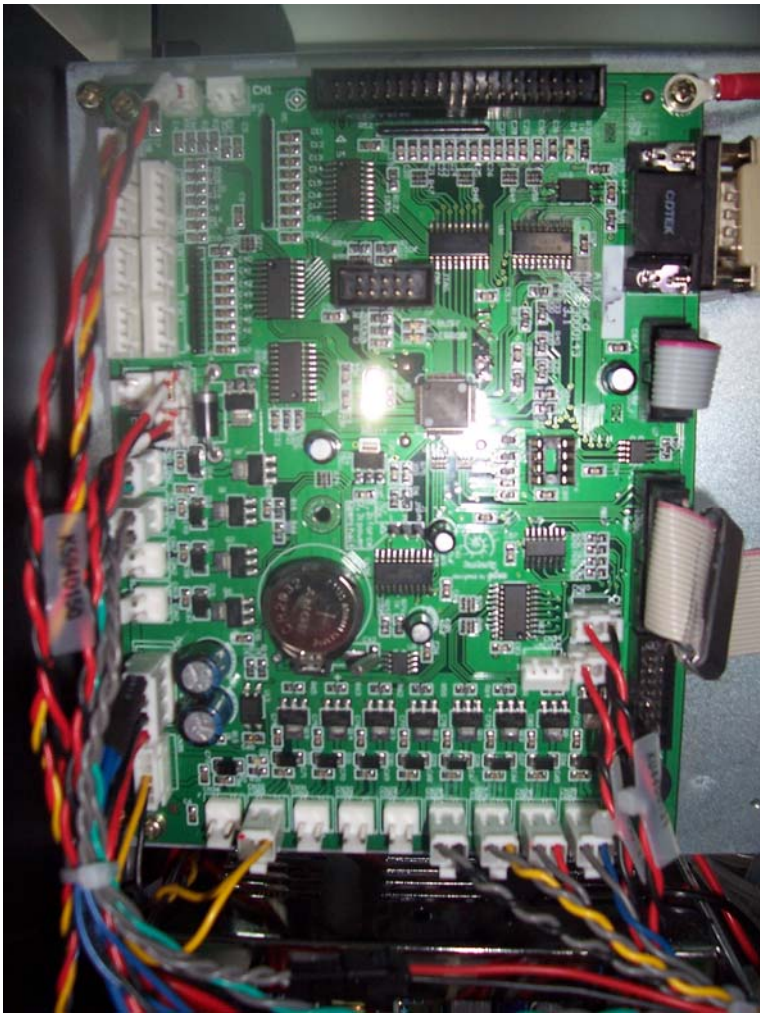


Chart 7-3-5 Assistant board

7.4 Function Description

1. This system work automatically and control several pumps to supply ink simultaneously. When printer is power on, ink pump starts automatically to pump ink to assistant ink tanks from main ink tanks.
2. The system works with perfect alarm and protection function. If any problem occurred in any pump, it will alarm and indicate which one is in trouble on the LCD and the troubled one will not affect others.
3. Ink filter switches get signals through serial ports.
4. It is easy to connect it to other systems. All floating switches signals can be input by serial port or parallel port.
5. Main controller consists of micro CPU, which can check signals using software to filter out the false ones, which is helpful to make system work more reliably.
6. The ink-pumping limit is controlled by intelligent control system of main control board; in case that the electric circuit will cause ink supply shortage.

7.5 Operation Description

Note:

Please read descriptions carefully for ink supply system, cleaning system and Ink Control system before starting the following operations.

1. As soon as the printer's connected with power, system detects floating switch signal automatically, and drives ink pumps to pump ink to assistant ink tanks if it found ink not enough, "**Warning 3**" displays on the LCD.
2. When ink channel lacks of ink, system will start the pump automatically; and indicator lighten. After the floating switch senses the ink, the pump will continue to work for a little period and then stop; and the indicator light extinguishes.
3. When ink in assistant tanks is used out or other reasons cause some pump running overtime, the system will alarm (voice a straight buzz) and "**Err5**"displays on the LCD. Press "ENTER" key on control panel to refill ink and cancel alarming.
4. When safety tank is full, system will alarm as short buzz and "**Err6**" displays on the LCD. Then you should empty the safety bottle.

7.6 Intelligent Detection Function

Intelligent detection function for ink supply system is implemented by collecting floating switch signal with high frequency. By using concept of probability, the signal is regarded as effective if probability of floating switch signals is higher than a set value (for example, 80%). Therefore, wrong act of floating switch can affect the system's stability much less and accordingly system's anti-disturbance improves.

Chapter 8 Clean and capping System

8.1 Summary

This printer adopts automatically positive pressure cleaning and manually capping system. You may execute cleaning before printing, during printing or idle for a long time.

Remark: when turn on the printer and after the self diagnoses the printer will automatically do a auto clean one time. Please see 8.4.1 for detail process.

8.2 System Diagram

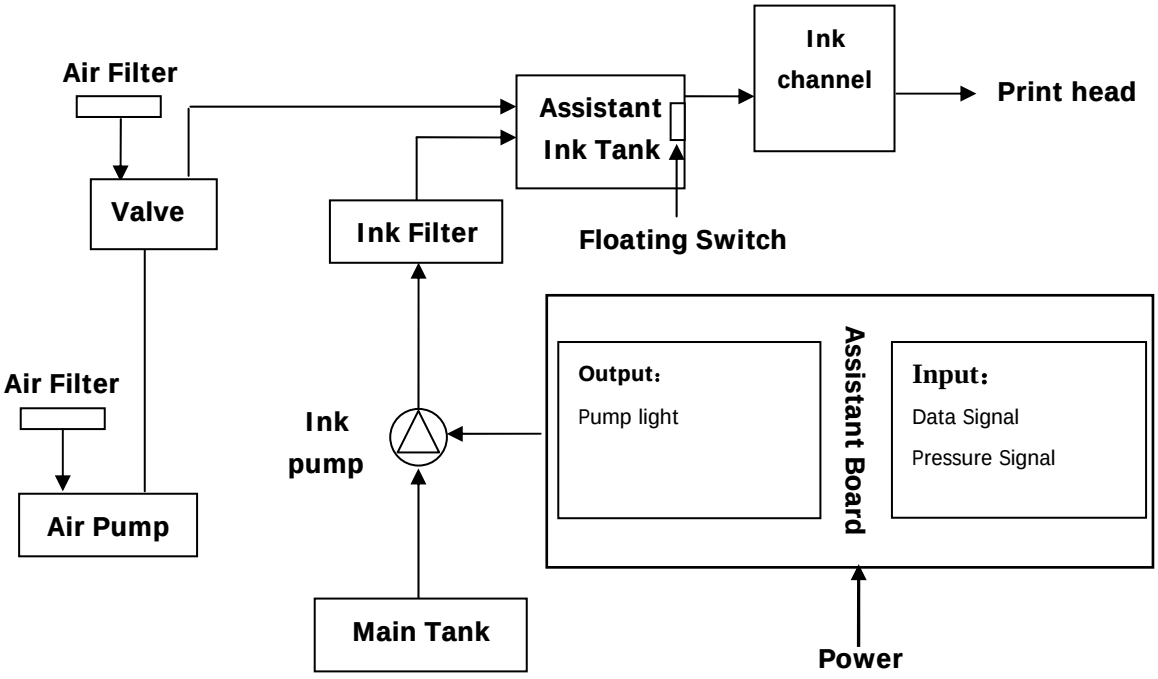
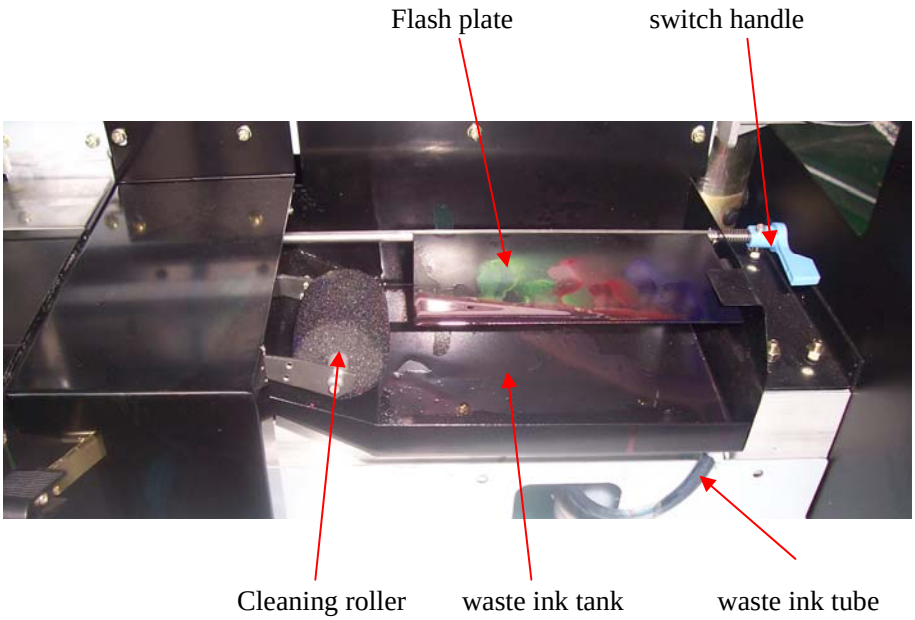


Chart 8-2-1 Ink supply and cleaning system diagram

8.3 Working principle of Positive Pressure Cleaning

When you press “clean” button, the cleaning signal will be transfer to assistant board and drive the air pump and ink pumps; air pump starts running and transfers air pressure to valve; the air pressure raises and transfers to assistant ink tanks through air channels. With pressure got from the air pump, ink will be purged through the head and nozzles. At the same time ink pump pumps ink to assistant ink tanks from main ink tanks, provides ink for print heads cleaning.

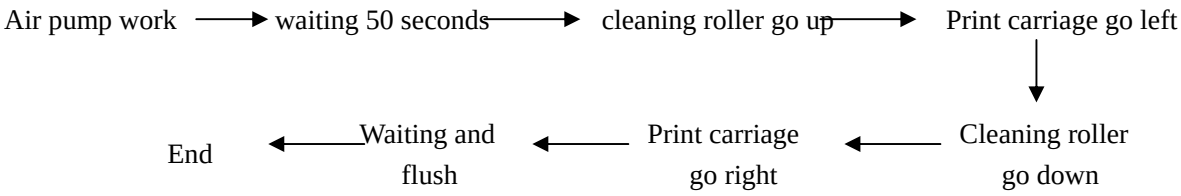
8.4 Operation Description of automatically Positive Pressure Cleaning



Summary: The automatically Positive Pressure Cleaning have two mode.

8.4.1: auto clean

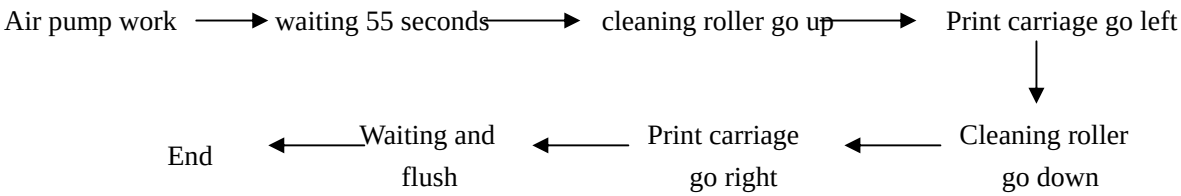
One cycle of auto clean process have below steps:



The total time of the auto clean process spend 80 seconds. The LCD will display BUSY and there is no other operations in this process.

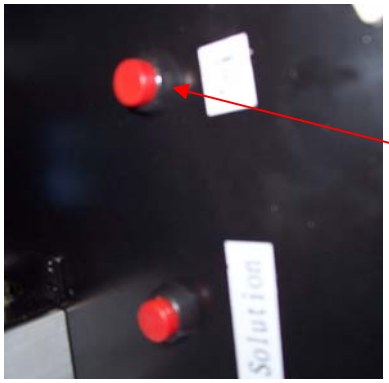
8.4.2: auto clean heavy

One cycle of auto heavy clean process have below steps:



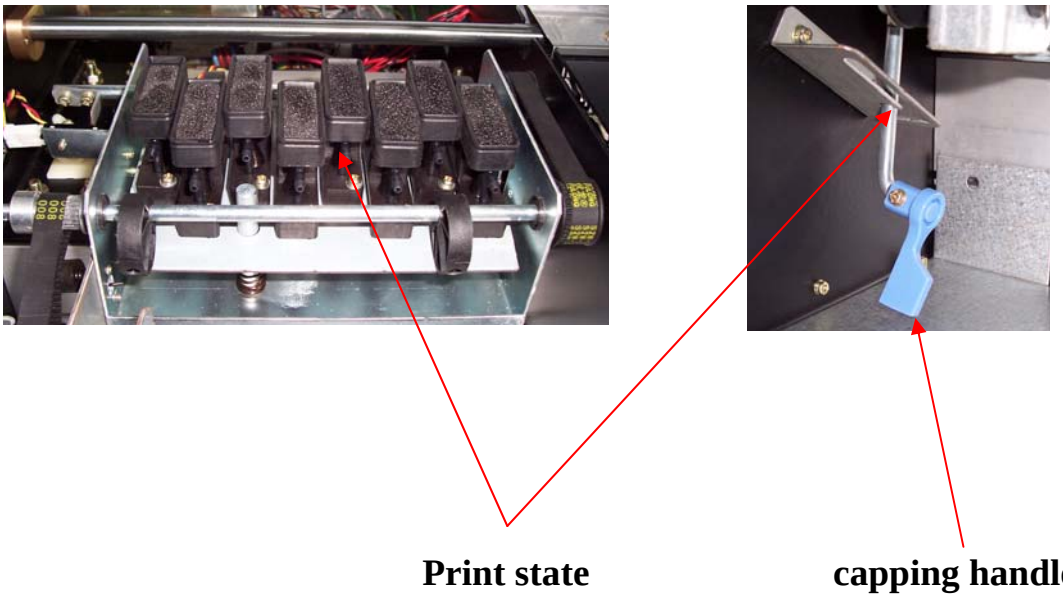
The total time of the auto clean process spend 85 seconds. The LCD will display BUSY and there is no other operations in this process.

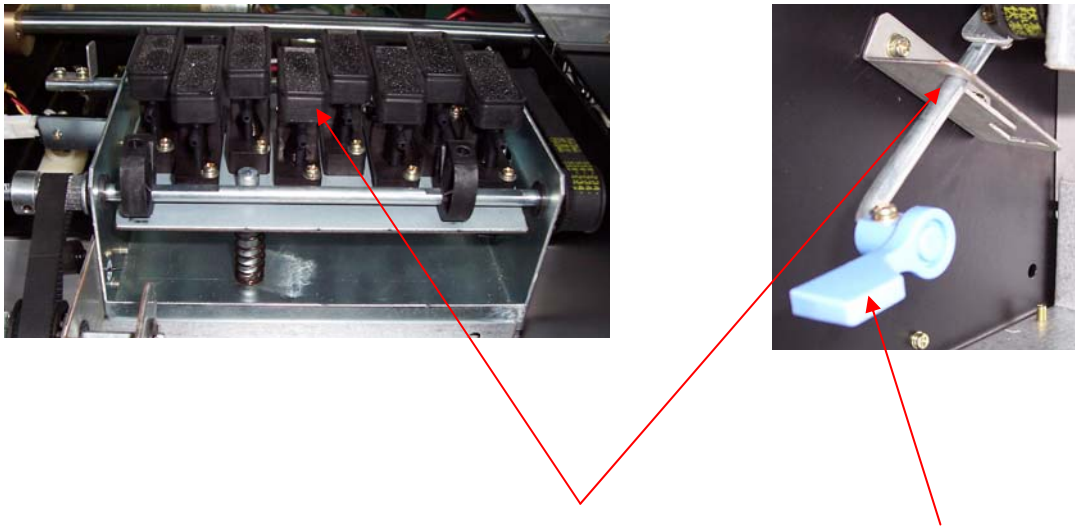
8.5 Operation Description of manually Positive Pressure Cleaning



If the auto clean system can not get the perfect effect, you can press the Positive Pressure Cleaning button and manually clean the P/H by use the clean stick with sponge.

8.6 Operation Description of manually capping system





Capping state **capping handle**

Caution:

Please put the capping handle on the print state before you turn on the printer or else the printer can not finish self diagnoses

Please move the print carriage to clean position and put the capping handle on the capping state before you turn off the printer or else the print head will be clogged.

Chapter 9 Heating System

9.1 Summary

This heating system include Pre-heater, middle plate heater, P/H heater and it can adjust temperature based on different media material and temperature. It can adjust the temperature automatically to keep temperature constant. Customer can have satisfactory printing effect.

9.2 System Diagram

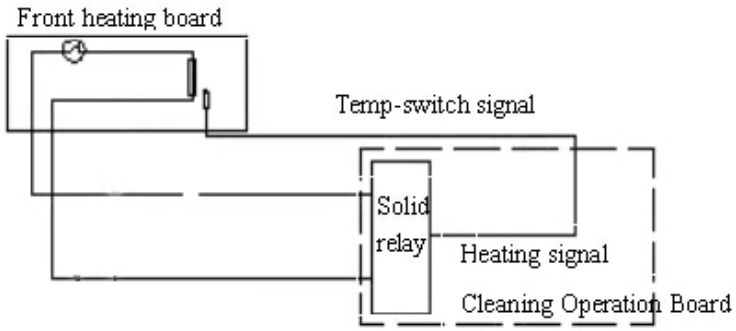


Chart 10-1 System diagram

9.3 Function Description

1、To keep the front heating board in auto constant temperature.

2、 With advanced protective functions to avoid over-heating, leakage, etc. The line will be cut off automatically if a certain line's temperature is over 70° C. As soon as the temperature lowers, it will resume heating. Over heating will not occur when the entire input signal is cut off.

3、 The system can work independently and can be easily transplanted. It should be optional to select the input voltage from AC110V to 220V.

4、 The heating system is controlled by advanced intelligent microprocessor; it has features of heating up quickly, controlling temperature accurately and saving energy.

5、Inner heaters are used. It is easy to install, with no extra space needed and longer lifetime.

9.4 Working Process and Characteristics

1. Users can amend the temperature of front heater from LCD.
2. Heating power supply is independent from control power supply. Please turn on the heating power before turning on the power for the printer. Once the power is on, the system heats up automatically to set temperature and keeps the temperature at the set value. Without turning on power for printer, the heating system will not work. However, there is still AC 220V inside machine.
3. Temperature detector lies about 50cm to the right physical printing original position. Print media should cover this region when printing.
4. After printing, make sure to turn off the two powers.

Chapter 10 Software Operation

10.1 Installation of Software:

10.1.1 Installation of RIP

a) Insert RIP CD into computer's CD-ROM

b) Run RIP .exe

c) Follow the instruction to finish the installation

10.1.2 Installation of printer driver

a) Insert installation CD into CD-ROM

b) Run setup.exe under directory of Try Setup

c) Follow the instruction to finish the installation

Note:

Please use the default directory for the installation.

10.2 Application of Printer Driver

Note：

The driver program is only for engineer to adjust the print head，and not necessary for normal operation.

10.2.1 Enter TRY

1. Click **Start\Program\Try**, enter Try system.

2. Open TRY

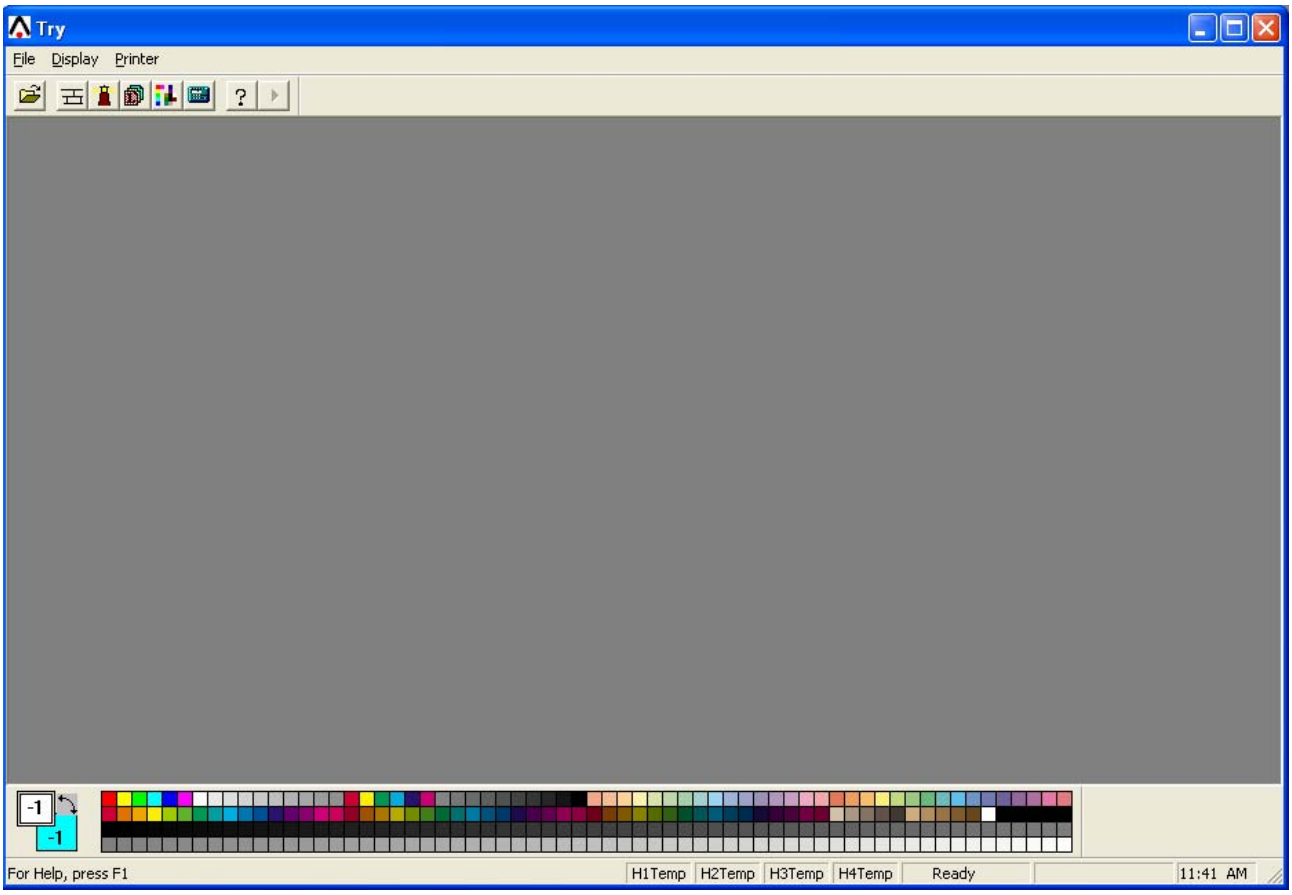


CHART 10-1 **TRY** main window

3. First, choose the type of printer. Click “Printer” menu，choose the item of FINA 160A

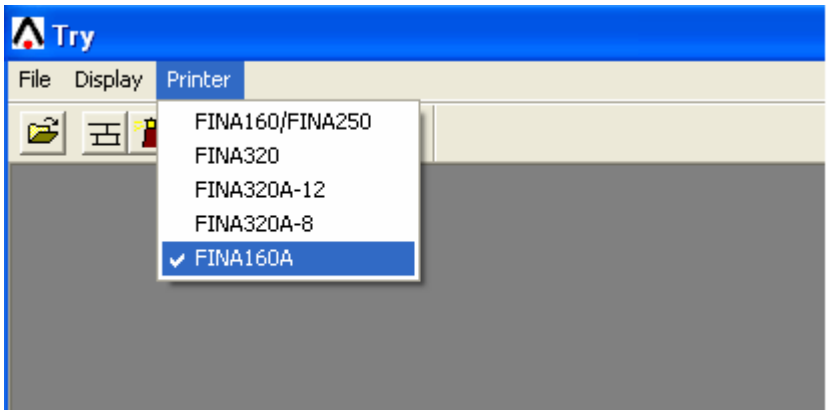


Chart 10-2 Machine type list

4. Then open “File” to adjust some settings.

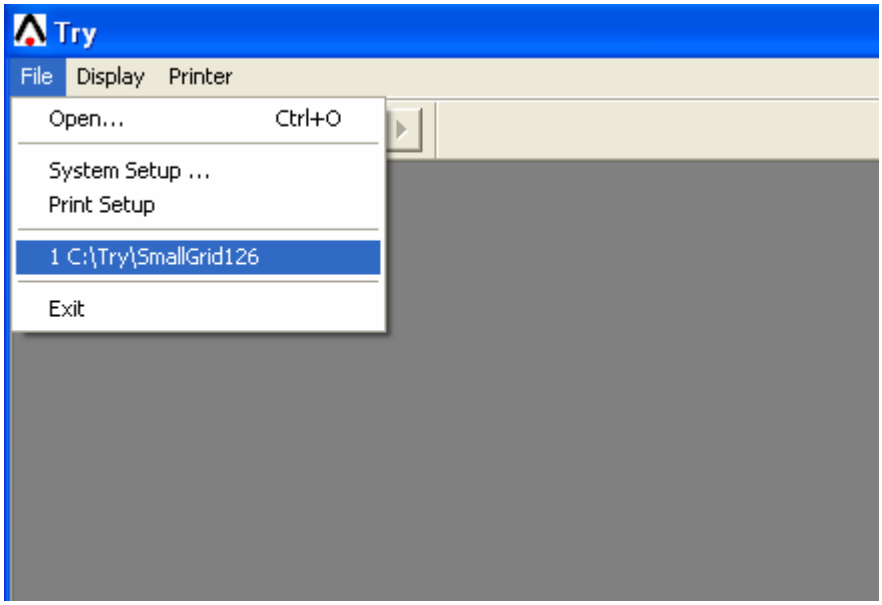


Chart 10-3 “File” menu

10.2.2 Print Setting

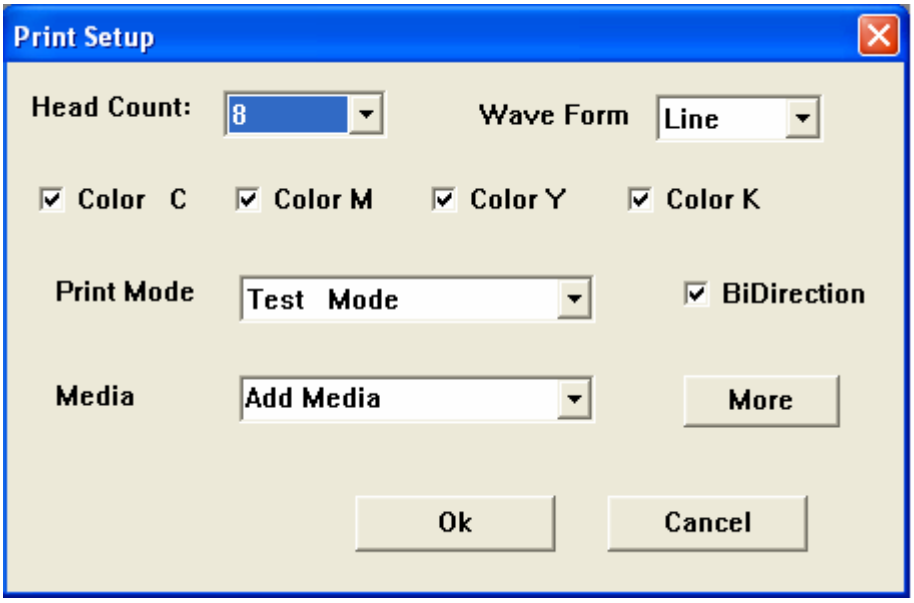


Chart 10-4 “Print setting” dialog box

This function is to set the printing parameter, print mode, uni-direction, BID and the color of ink.

Note:

Usually, the four colors should all be selected. Only when the engineer adjusts the position of head, one certain color is chosen to modify the printing parameter.

P/H QTY： This software support 4 and 8 print head optional.

PRINT MODE：

IT have 5 mode：

TEST MODE

3 PASS

4 PASS

6 PASS

8 PASS

10.2.3 Printer Parameter Setting

Pressing “Printing parameter setting”, it shows warning as below:

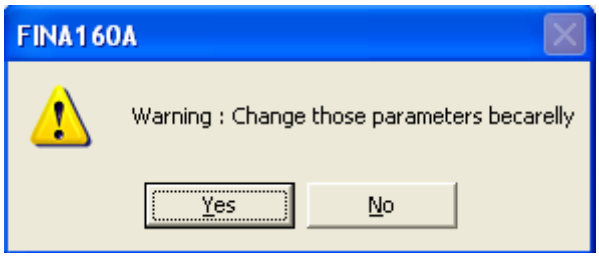


Chart 10-5 “Warning” dialog box

After pressing “Yes”, you can see the dialogue box:

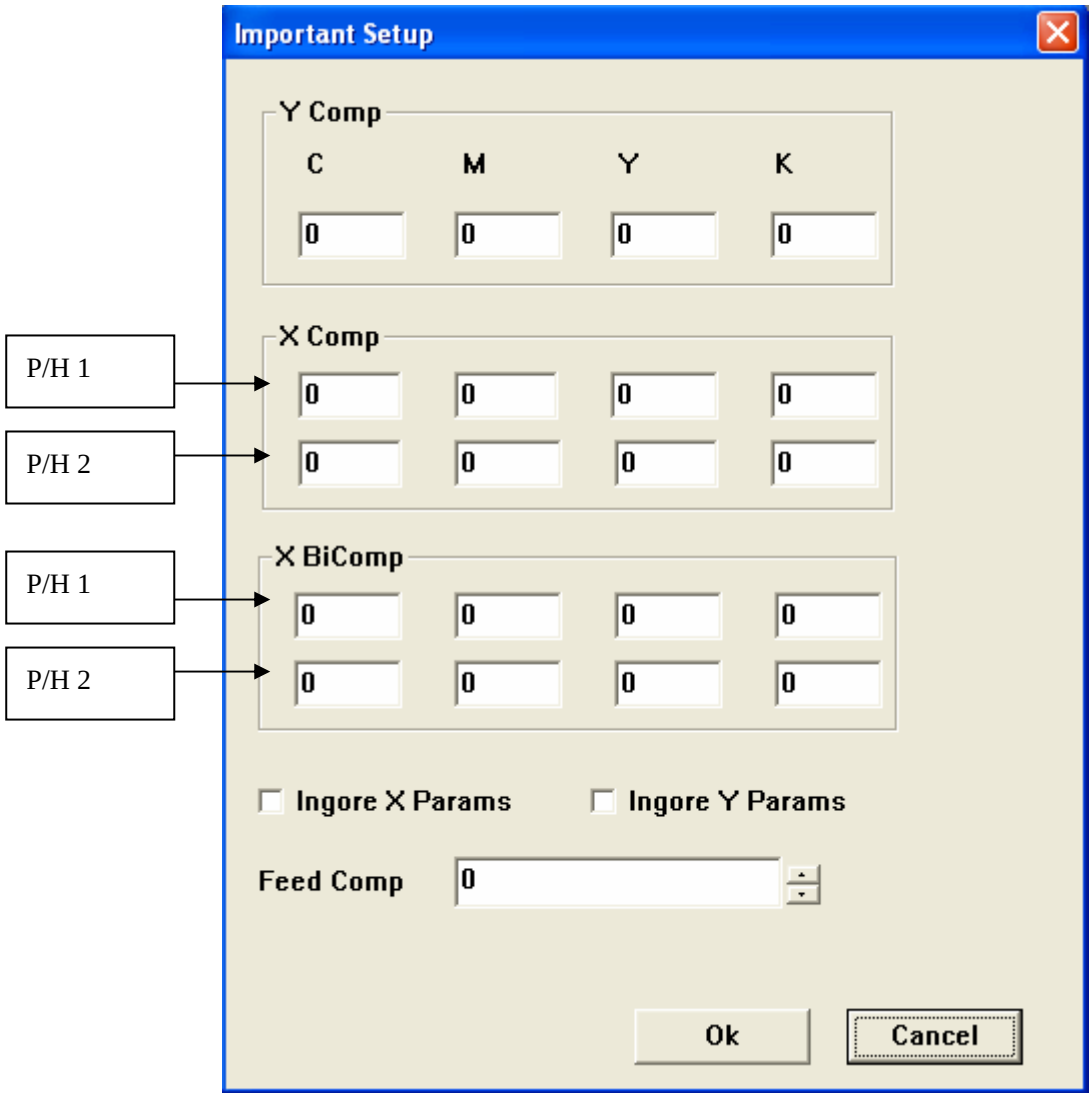


Chart 10-6 Important setup

1. Parameter of nozzle installation:

Adjust the head position and overlapping of four colors.

Vertical space: the vertical space between print heads of all kinds color. It's used for emendating vertical space overlapping of all kinds color print heads.

Horizontal space: the horizontal space between every print head. It's used for emendating overlapping of four colors.

The print head range chart lists as below:

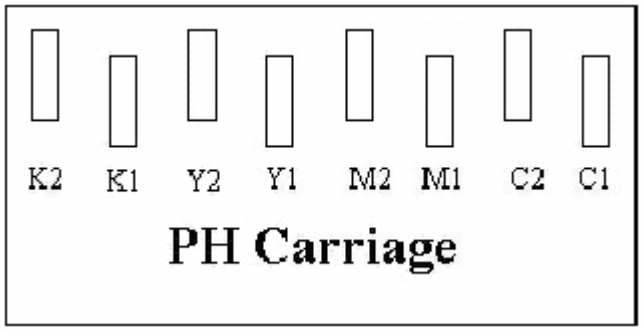


Chart 10-7 Print head range chart

2. BID Rectangle:

To adjust the BID rectangle tolerance value. Generally, modify BID rectangle value first in *BID adjust.* If the difference is not big, adjust here.

3. Ignore horizontal and vertical deviation:

No adjustment. Only for inspect printer status.

Feed Compensate：

Used to adjust the feeding on the Y direction. The amount of feeding is different with different Pass. After adjusting, it can correspond relevant rectangle automatically by different printing mode and media types.

10.3 Print head adjustment with TRY

Software adjustment have 4 steps：Two print heads one color adjustment, four color overlap（horizontal and vertical），BID overlap，Feeding compensation adjustment。It should be used “SmallGrid126.group” file to adjust these parameter under the TEST Mode. Below is the detail steps：

1、Select Open/File, load the file C:\try\SmallGrid126.group

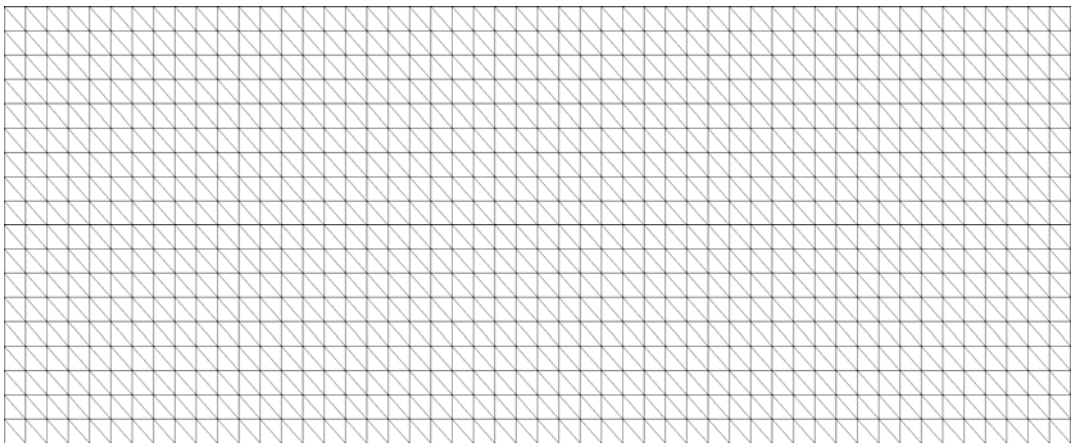
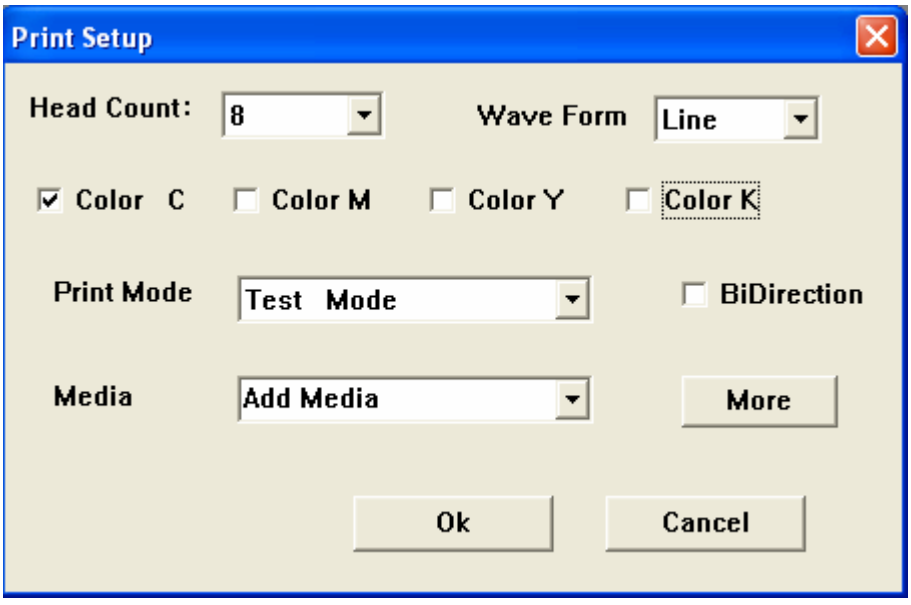


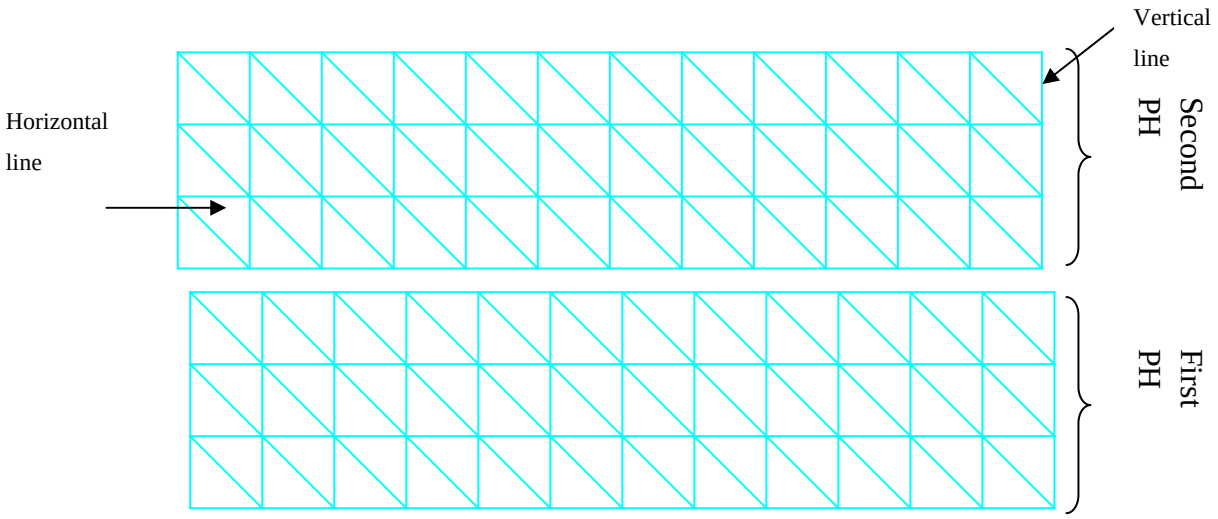
Chart 10-8　SmallGrid126.group

2、Adjust the 4 color overlap：Open TRY and go into the “print setup” dialog. Select the corresponding quantity of print head（eight or four） and corresponding color，Cyan is the benchmark color, The four color overlap is beginning with cyan:



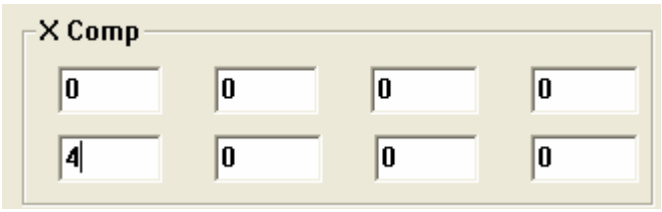
10.3.1 Vertical adjustment for two PH with one color:

Select cyan, line mode in the “print setup” dialog， print below picture（SmallGrid126.group）：

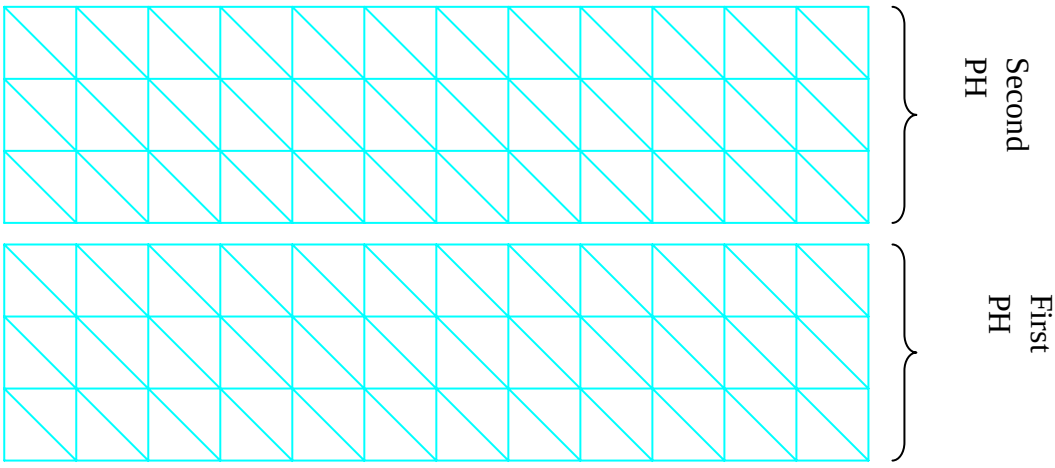


From this picture you can see the vertical line printed by the first PH and the second PH is not in the same line.

So you should adjust the vertical compensation for the second PH, plus number: the second PH printing line will move right direction and minus number: the second PH printing line will move left direction. For this picture you should put plus number 4 in the “Para setting” dialog(number 4 is just a sample you should set repetitious then get the correct number)。



After set the parameter Print again then get the below picture：

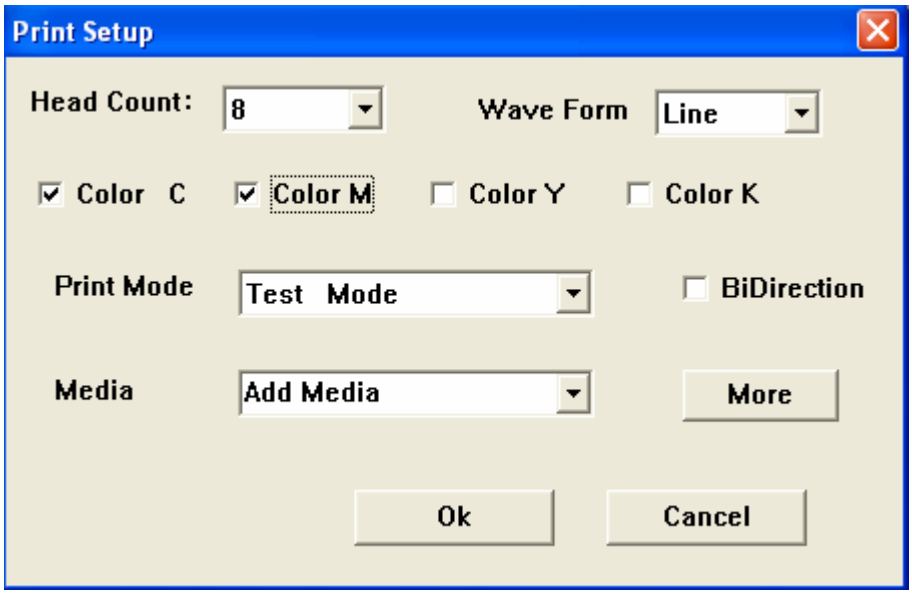


We get the perfect picture after the vertical adjustment. **It is the same method for other three color (magenta yellow black) vertical adjustment.**

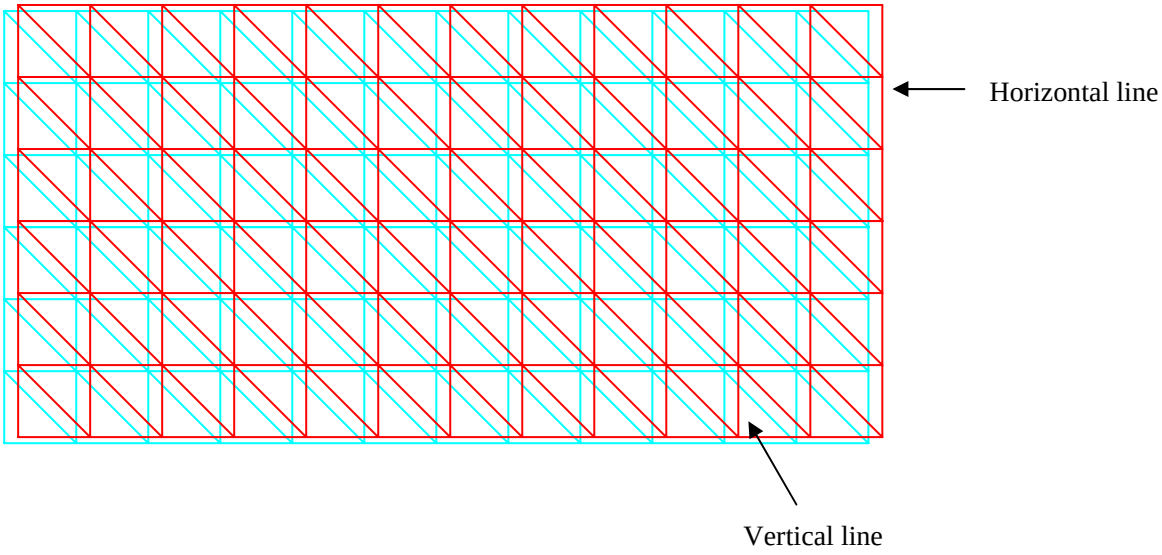
10.3.2 Four color overlap：

After the first step for two print heads vertical adjustment, The second step is the four color overlap.

1、 Please go into the “print setup” and select CYAN MAGENTA：

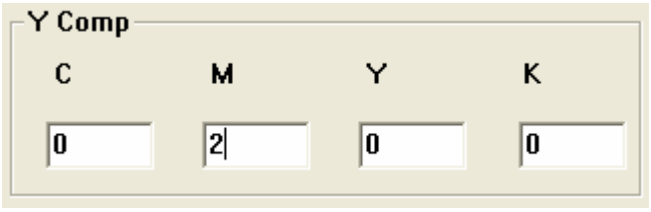


2、 Printing（SmallGrid126.group） file：

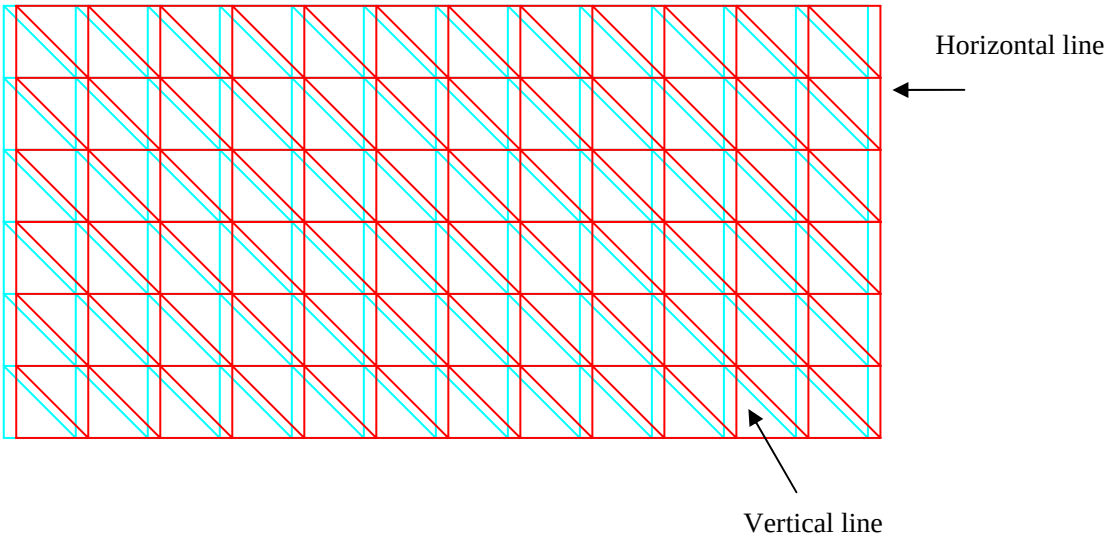


The horizontal line and the vertical line of the two color is not in the same line. So you should adjust the horizontal compensate and the vertical compensate parameter for this two color and let the two color in the same line.

From this picture you can see the magenta horizontal line is a little bit upper than cyan, So you should adjust the horizontal compensate for magenta PH。 Plus number:：magenta line will go down。 Minus number：magenta line will go up。For this picture you should put plus number 2 in the “Para setting” dialog(number 2 is just a sample you should set repetitious then get the correct number)：

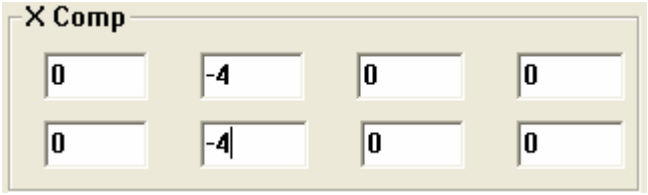


After set the parameter Print again then get the below picture：

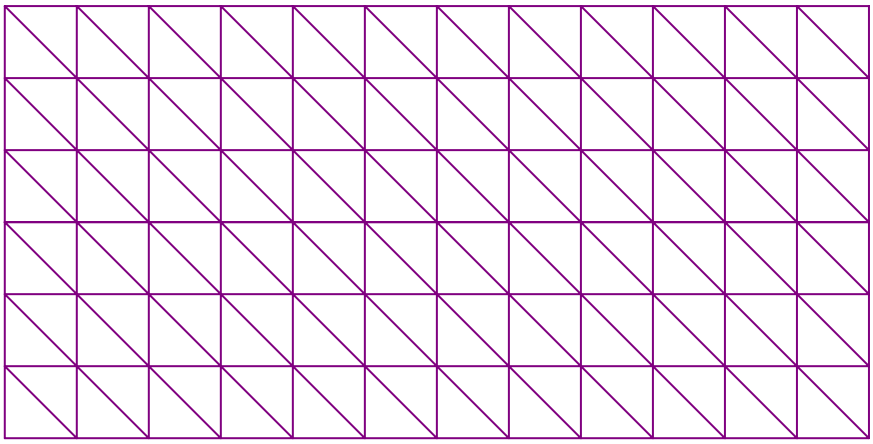


It is ok for horizontal line then you should adjust the vertical line for the two color print heads。

From this picture you can see the magenta vertical line is a little bit right than cyan, So you should adjust the vertical compensate for magenta PH。 Plus number:：magenta line will go right。 Minus number：magenta line will go left。For this picture you should put minus number 4 in the “Para setting” dialog(number 4 is just a sample you should set repetitious then get the correct number)：

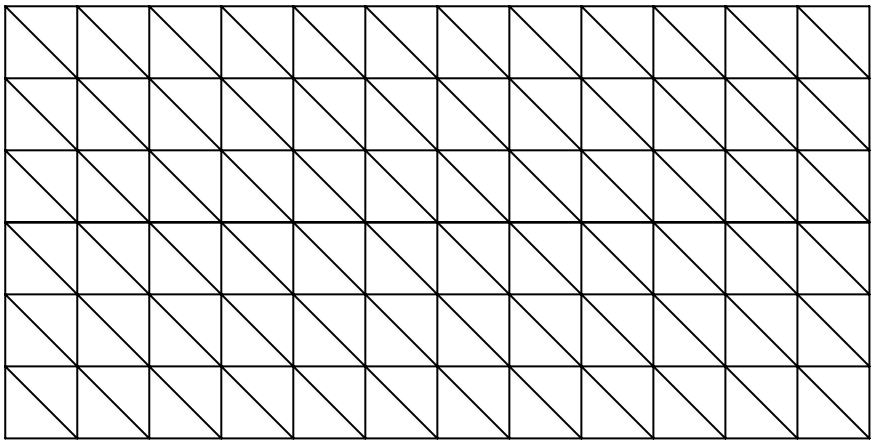


After set the parameter Print again then get the below picture：



It is the same method for other two color (yellow black) four color overlap.

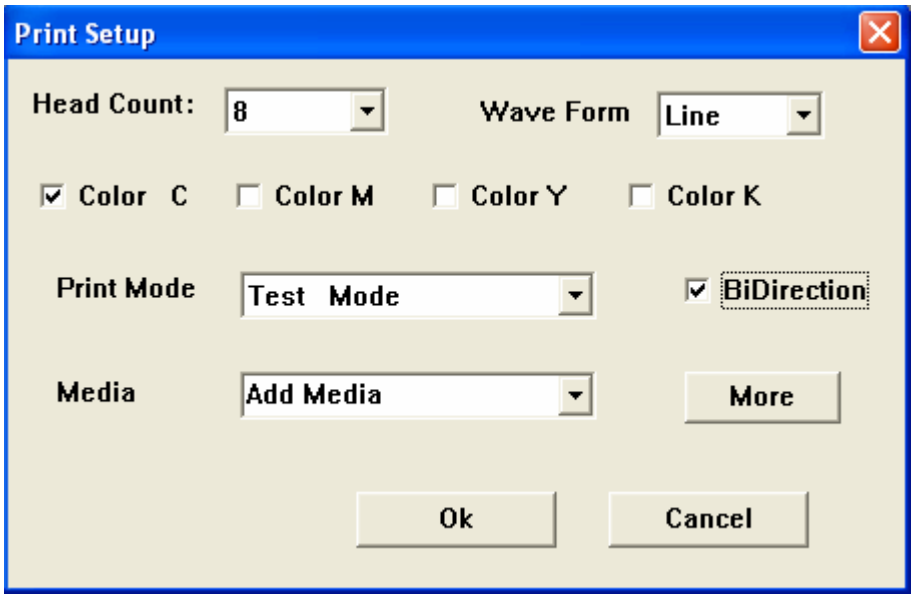
After adjust the yellow and black parameter we get the final picture as below：



This is a perfect picture for four color overlap adjustment！

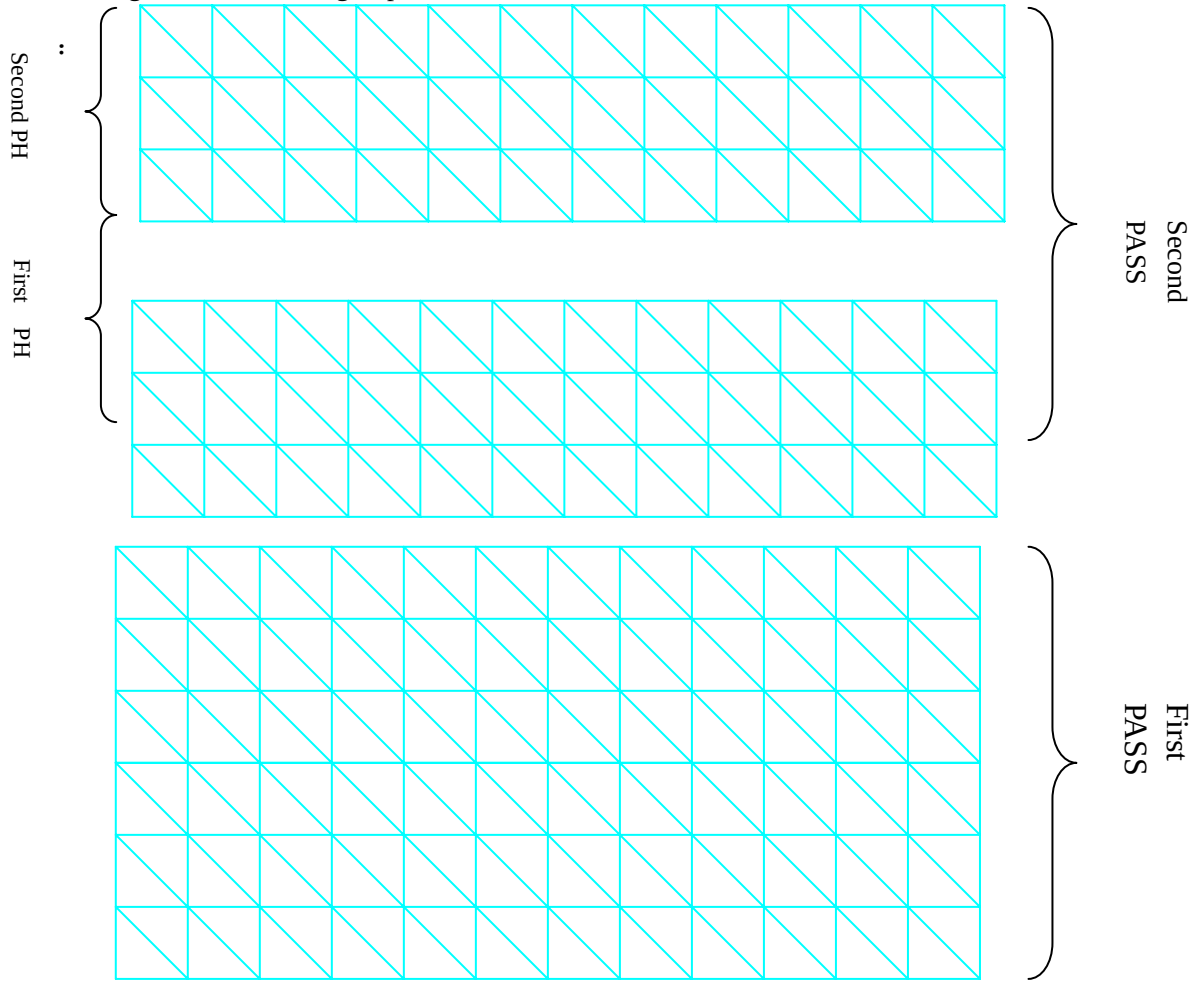
10.3.3 BID overlap：

1、Please go into the “print setup” and select Bidirction：

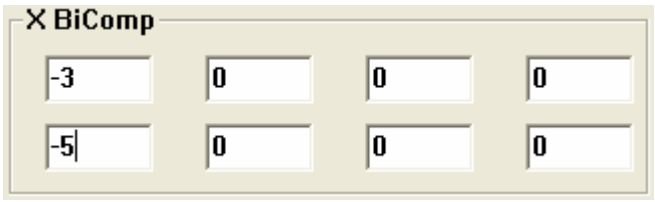


Every color is individual for BID overlap (cyan is also the benchmark)

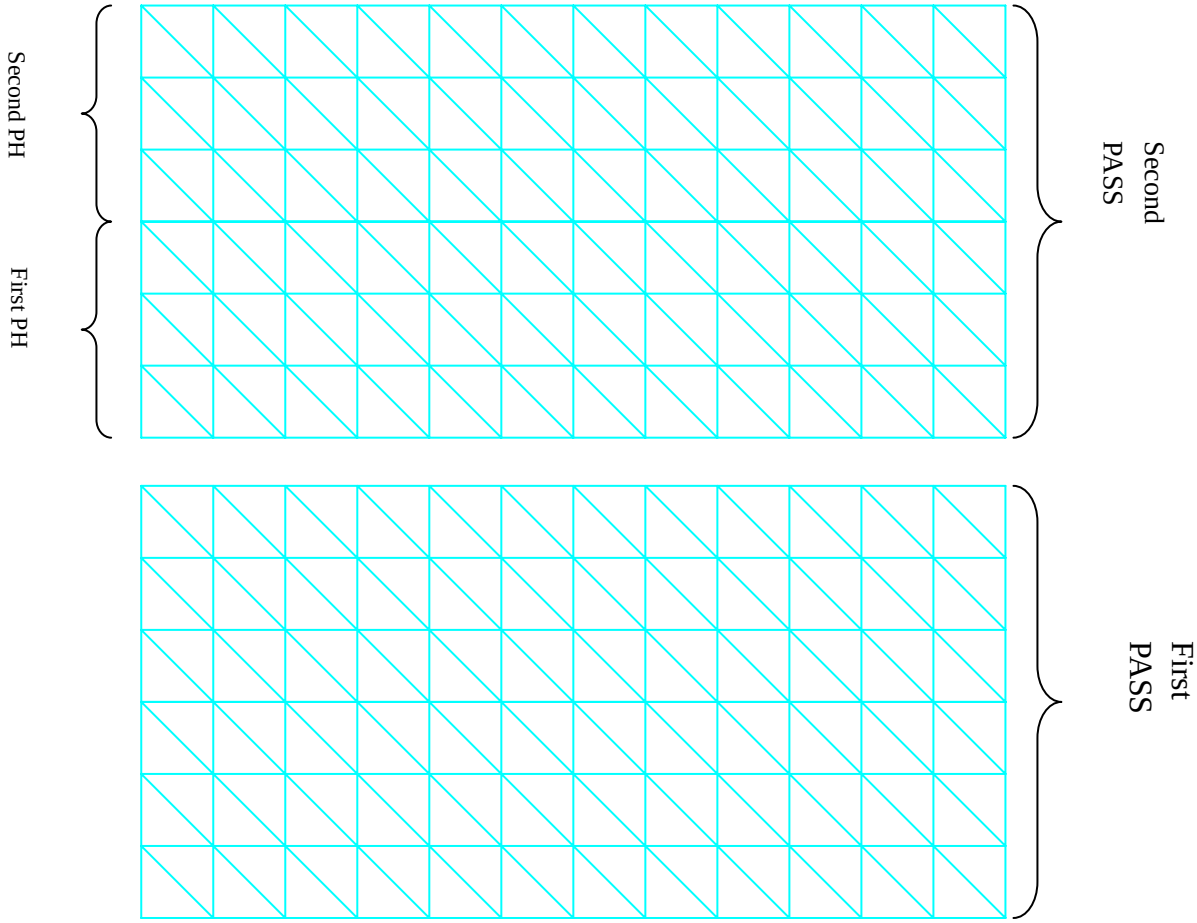
Printing（SmallGrid126.group） file：



From this picture you can see the first PH and the second PH of the SECOND PASS is a little bit right than FIRST PASS, So you should adjust the BID compensate for cyan PH。Plus number：line will go right。Minus number：line will go left。For this picture you should put minus number 3 for first PH and minus number 5 for second PH in the “Para setting” dialog(number -3 and -5 is just a sample you should set repetitious then get the correct number)：

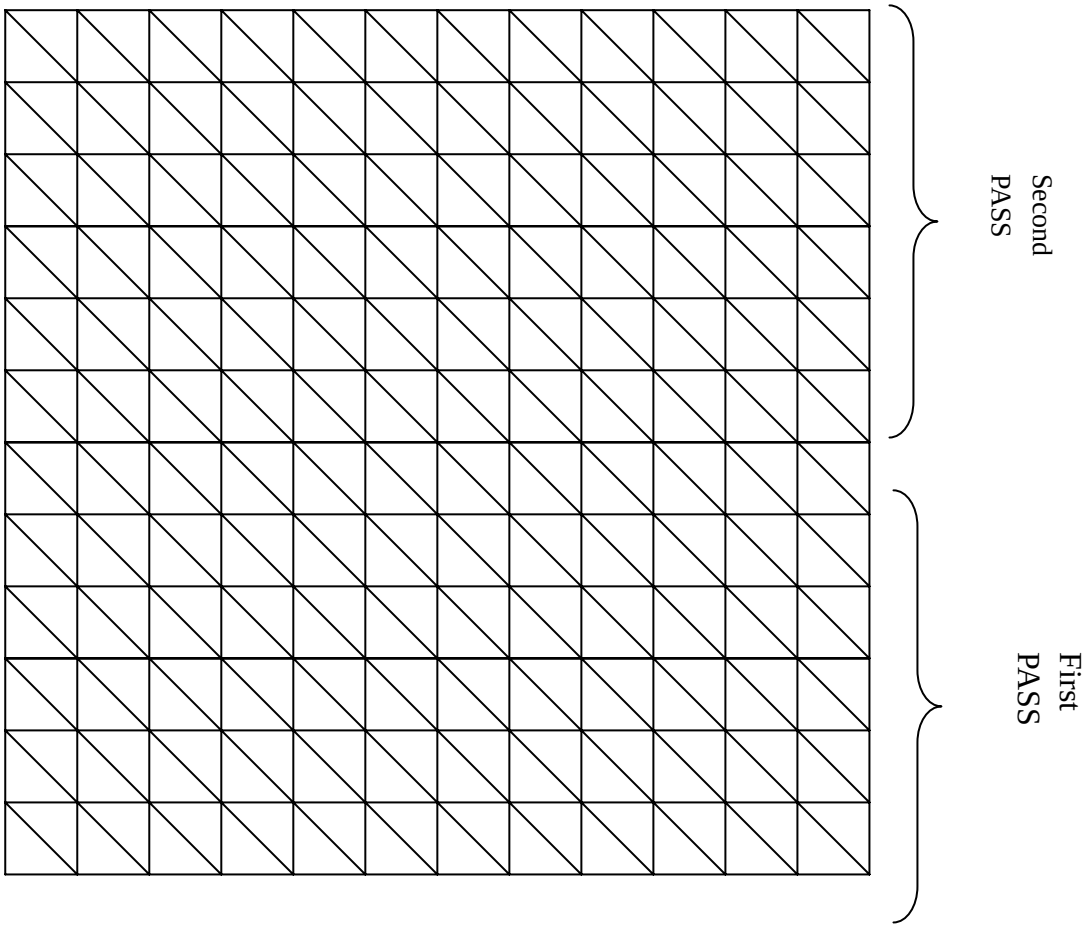


After set the parameter please print again the picture（SmallGrid126.group）：



It is the same method for other three color (magenta，yellow，black) for BID overlap.。

After finished all of four color BID overlap， You should select all the four color in the “print setup” and print the （SmallGrid126.group）：



ATTENTION：

The BID compensation is different for different height of the print head surface with print platform。

10.3.4 Feeding compensation adjustment：

1、 It is no need for TEST mode， The initialization is“0”，Tolerance is“±10”。

2、 With 3PASS、4PASS、6PASS、8PASS mode，We use the normal image for feeding compensation。You should reduce the feeding compensation number if there is some blank in the image and add the feeding compensation number if there is overlap in the image.

ATTENTION：

The feeding compensation is different for different media.

Chapter 11 Maintenance

11.1 Daily Maintenance

Daily maintenance is very important for normal workstation of the printer. Daily maintenance includes:

①Maintenance after each printing：

- Erasure dried ink from print head surface with flush solution；
- Restore the jammed nozzles before next printing.

②Each 8 hours：

- Oil the print head rail and clean the dust from it once each 8 hours.

③Daily work：

- Check waste ink tank, cleanup if necessary；
- Check the waste ink groove on the startup position and clean it if necessary；
- Check the sponge on the wet-keeping frame, clean or replace it if necessary；
- Clean feeding and take-up rollers with PM acetate. Skid on the rubber roller will cause error code from service and impact print quality.
- Do normal clean for the printer everyday.

④Weekly work：

- Clean the dust on the surface of fans on dry board. Assemble them after ensure clearness of the leafages.
- Check pump route if there is any loose.

⑤Monthly work：

- Clean the filters of C、M、Y and K；
- Check the tension of straps；
- Clean dust in the power tank.

⑥yearly work：

- Replace ink filters；
- Blower the dust on power tank with compress air；
- Clean the ink supply routes；
- Clean the liquid pumps for ink supply；
- Oil the gears of feeding and take-up motors.；
- Check whole circuit if there is any loosen or broken. Repair it in time if necessary；Check if there is any tear on the tube and wire in the towline set and replace it if necessary。

11.2 Maintenance of print head

Always keep the surface of print head wet with flush solution. If the printer is left unused, the print head must be dropped with flush solution and covered with fresh-keeping polyethylene films to keep it wet.

1. Moisturizing of print head：

If the printer is left unused for 2 day and above, do as below to keep the print head wet：

1、 Dip the unwoven fabric with flush solution；

2、 Cover the unwoven fabric on the surface of print head；

3、 Wrap the print head unit with fresh-keeping polyethylene film；

4、 Cover the wet-keeping frame the print head。

2 Unload print head：

Do as follows when you are going to unload print head：

1、 Pump out ink from print head and clean it with flush solution；

2、 Power off the printer and plug out power line from socket；

3、 Check static on the machine with a multimeter and release the static if necessary；

4、 Loosen the Up, Left and Right screws, and take out the right screw；

5、 Take out the print head and put it on an unwoven fabric soaked with flush solution。

3. Assemble print head

1、 Power off the printer and plug out power line from socket；

2、 Check static on the machine with a multimeter and release the static if necessary；

3、 Loosen Up and Left bolts, take out Right bolt and fix the print head to the frame; Put on Right bolt and tighten Up, Left and Right bolts properly.

4、 Connect the data cable to print head connect board one by one。

5、 Check the connection of data cables to eliminate wrong connection.。

Caution：If the data cable is wrong connected, the print head will damage when power on.

11.3 Maintenance for ink supply system

The ink supply system is a very important. Maintenance for ink supply system is also very important. The ink supply system includes main ink tank system and assistant ink tank system with filters to separate the ink from the open air. So cleanness of environment is primary condition to place the printer.

1. Main ink tank system：

Main ink tank system consists of main ink tanks, filters, liquid pumps and waste ink tanks. Maintenance includes：

1、 Clean the main ink tanks, especially air filters, monthly；

2、 Clean or replace filters of ink and flush solution per half year；

3、 Clean around the main ink tank system weekly；

2. Assistant ink tank system：

Assistant ink tank system consists of assistant ink tanks, safety tanks and trilateral valves. Ink drops get together on the floaters in assistant ink tanks and dry to shape small balls on the top of sensors, which will impact the sensitivity of sensors. To clean the floater, do as follows：

1、 Pump out ink from ink tubes by operating on clean control panel；

2、 Unload the 4 assistant ink tanks from the back of print head unit；

3、 Loosen and take out bolts from the cover boards of assistant ink tanks and then take the cover boards and floaters；

4、 Clean the floaters and assistant ink tanks with unwoven fabric and sponge soaked with flush solution. Ensure the floater switch move smoothly and then dry floaters and assistant ink tanks；

5、 Reload floaters in assistant ink tanks and assemble assistant ink tanks on the back of print head unit。

The safety tank also needs cleanness timely. The method is same as assistant ink tank except for the 2 air filters in addition。

The trilateral valves in the ink supply system are also very important and need cleanness with flush solution timely when they are smeared by ink.

Warning:

Ink supply integration box should clean by authorized personnel only. Improper operation will result in ink supply system troubles.

11.4 Maintenance for other parts

1. Lubrication for print head rail：

As normal regulation, user should add lubricating oil to print head rail daily and never use compound oils。

1、 Add a few lubricating oil on a cotton fabric and move the print head to original position. Brush the print head rail with the cotton fabric to create an average oil layer on the rail.；

2、 Power the printer and move the print head unit left and right repeatedly；

3、 Erase the oil smear on the both ends of the rail. Erase the oil drops on the rail again before printer running。

2. Feeding and take-up rollers：

Oil the gears of media feeding and take-up rollers monthly to avoid rust。

CHAPTER 11 ERROR MESSAGE

err24 user not match

err23 aux(ink supply board) error

err22 rtc(ink supply board) error

err21 time out

Wrn20 will time out

Wrn19 Heating not complete

err16 Original Position Sensor not connect

err15 cfgrom err

err14 aux(ink supply board) ver err

err13 FPGA(main board) ver err

err12 se anti-counter is not correct

err11 se error between command and action is large

err10 Y raster not connect

err9 Y raster direction of conter is different from motor

err8 Motor Board Error

err7 ErSt_InkAOverflow

err6 ErSt_InkSOverflow

err5 ErSt_InkTimeOut

err4 ErSt_InkPressure